

SEQUENCE LISTING

<110>Young, James
Kiener, Peter
Osterhaus, Albertus
Fouchier, Ronaldus

<120> METHODS OF TREATING AND PREVENTING RSV, HMPV, AND PIV USING ANTI-RSV,
ANTI-HMPV, AND ANTI-PIV ANTIBODIES

<130> 10271-072-999

<140> To be assigned

<141> Herewith

<150> 60/398,475

<151> 2002-07-25

<160> 437

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 2507

<212> DNA

<213> metapneumovirus

<220>

<221> CDS

<222> (1)...(2507)

<223> Human metapneumovirus isolate 00-1 matrix protein
(M) and fusion protein (F) genes

<400> 1

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ctgacctgaa aatggccggt agcttcagtc aattcaacag aaggttccta aatgttgtgc 1500
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gctccgtaat ttacatgggt caactgccaa tctttggggg tatagacacg ccttgctgga 1740
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aagaccaagc atggtattgt caaaatgcag ggtcaactgt ttactacca aatgaaaaag 1860
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agcagtcaaa ggagtgcac ataaacatat ctactactaa ttacccatgc aaagtttagca 1980
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aaggctgctc ttatataacc aaccaagacg cagacacagt gacaatagac aacactgtat 2160
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gctttgaccc agtcaagttt cctgaagatc aattcaatgt tgcacttgac caagttttcg 2280
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agaaaaggaaa cactggcttc atcattgtaa taattctaatt tgctgtcctt ggctctacca 2400
tgatcctagt gagtgttttt atcataataa agaaaacaaa gagaccaca ggagcacctc 2460
cagagctgag tgggtgtcac aacaatggct tcataccaca taattag 2507

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<210> 2

<211> 1596

<212> DNA

<213> pneumovirus

<220>

<221> CDS

<222> (1)...(1596)

<223> Avian pneumovirus fusion protein gene, partial cds

<400> 2

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acaggatggt atacaaatgt gttcacactt ggggttgagg atgtgaaaaa tctcacatgt 180
accgacgggc ccagcttaat aagaacagaa cttgaactga caaaaaatgc acttgaggaa 240
ctcaagacag tatcagcaga tcaattggca aaggaagcta ggataatgtc accaagaaaa 300
gcccggtttg ttctgggtgc catagcatta ggtgtggcaa ctgctgctgc tgtgacggct 360
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gctgtgaatg atctcaagga ctttataagt aaaaaattga cacctgcaat aaacaggaac 540
aagtgtgaca tctcagacct taagatggca gtgagctttg gacaatacaa tcggaggttc 600
ctcaatgtgg taagacagtt ttctgacaat gcaggtatta cgctgcaat atctctagat 660
ttaatgactg acgtgagct tgtaagagct gtaagcaaca tgcccacatc ttcaggacag 720
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ggagtttatg gtagctctgt ggtctatata gtgcagcttc ctattttcgg tgtgatagat 840
acaccgtgtt ggagggtgaa ggctgctcca ttatgttcag ggaaagacgg gaattatgca 900
tgtctcttgc gagaggacca aggttggtat tgtcaaaatg ctggatccac agttttattat 960
ccaaatgagg aggactgtga agtaagaagt gatcatgtgt tttgtgacac agcagctggg 1020
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cccaaattcc caatggaaat gaatgggtgtg aacaac 1596

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<210> 3

<211> 1666

<212> DNA

<213> pneumovirus

<220>
 <221> CDS
 <222> (14)...(1627)
 <223> Avian pneumovirus isolate 1b fusion protein mRNA,
 complete cds

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 gagtggttttg aggacaggat ggtatacaaa tgtgttcaca cttgagggttg gagatgtgga 180
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 gtcaccaaga aaagcccggg ttgttctggg tgccatagca ttaggtgtgg caactgctgc 360
 tgctgtgacg gctgggtgtag cgatagccaa gacaattagg ctagaaggag aagtggctgc 420
 aatcaagggt gcgctcagga aaacaaatga ggctgtatct acattaggaa atggcgtgag 480
 ggtacttgca acagctgtga atgatctcaa ggactttata agtaaaaaat tgacacctgc 540
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 cccttaattt tagttattaa aaaaaaaaaa aaaaaaaaaa aaaaaa 1666

<210> 4
 <211> 1636
 <212> DNA
 <213> rhinotracheitis virus

<220>
 <221> CDS
 <222> (13)...(1629)
 <223> Turkey rhinotracheitis virus gene for fusion
 protein (F1 and F2 subunits), complete cds

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<210> 5

<211> 1860

<212> DNA

<213> pneumovirus

<220>

<221> CDS

<222> (1)...(110)

<223> Avian pneumovirus matrix protein (M) gene, partial
cds

<220>

<221> CDS

<222> (216)...(1829)

<223> Avian pneumovirus fusion glycoprotein (F) gene,
complete cds

<400> 5

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gtgtgaacaa caaaggattt atcccttaat tttagttact aaaaaattgg gacaagtgaa 1860

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<210> 6
<211> 574
<212> PRT
<213> paramyxovirus

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<220>
<223> paramyxovirus F protein hRSV B

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<400> 6
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      20           25           30
Tyr Gln Ser Thr Cys Ser Ala Val Ser Arg Gly Tyr Phe Ser Ala Leu
      35           40           45
Arg Thr Gly Trp Tyr Thr Ser Val Ile Thr Ile Glu Leu Ser Asn Ile
      50           55           60
Lys Glu Thr Lys Cys Asn Gly Thr Asp Thr Lys Val Lys Leu Ile Lys
 65           70           75           80
Gln Glu Leu Asp Lys Tyr Lys Asn Ala Val Thr Glu Leu Gln Leu Leu
      85           90           95
Met Gln Asn Thr Pro Ala Ala Asn Asn Arg Ala Arg Arg Glu Ala Pro
      100          105          110
Gln Tyr Met Asn Tyr Thr Ile Asn Thr Thr Lys Asn Leu Asn Val Ser
      115          120          125
Ile Ser Lys Lys Arg Lys Arg Arg Phe Leu Gly Phe Leu Leu Gly Val
      130          135          140
Gly Ser Ala Ile Ala Ser Gly Ile Ala Val Ser Lys Val Leu His Leu
 145          150          155          160
Glu Gly Glu Val Asn Lys Ile Lys Asn Ala Leu Leu Ser Thr Asn Lys
      165          170          175
Ala Val Val Ser Leu Ser Asn Gly Val Ser Val Leu Thr Ser Lys Val
      180          185          190
Leu Asp Leu Lys Asn Tyr Ile Asn Asn Gln Leu Leu Pro Ile Val Asn
      195          200          205
Gln Gln Ser Cys Arg Ile Ser Asn Ile Glu Thr Val Ile Glu Phe Gln
      210          215          220
Gln Lys Asn Ser Arg Leu Leu Glu Ile Asn Arg Glu Phe Ser Val Asn
 225          230          235          240
Ala Gly Val Thr Thr Pro Leu Ser Thr Tyr Met Leu Thr Asn Ser Glu
      245          250          255
Leu Leu Ser Leu Ile Asn Asp Met Pro Ile Thr Asn Asp Gln Lys Lys
      260          265          270
Leu Met Ser Ser Asn Val Gln Ile Val Arg Gln Gln Ser Tyr Ser Ile
      275          280          285
Met Ser Ile Ile Lys Glu Glu Val Leu Ala Tyr Val Val Gln Leu Pro
      290          295          300
Ile Tyr Gly Val Ile Asp Thr Pro Cys Trp Lys Leu His Thr Ser Pro
 305          310          315          320
Leu Cys Thr Thr Asn Ile Lys Glu Gly Ser Asn Ile Cys Leu Thr Arg
      325          330          335
Thr Asp Arg Gly Trp Tyr Cys Asp Asn Ala Gly Ser Val Ser Phe Phe
      340          345          350
Pro Gln Ala Asp Thr Cys Lys Val Gln Ser Asn Arg Val Phe Cys Asp
      355          360          365

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Thr Met Asn Ser Leu Thr Leu Pro Ser Glu Val Ser Leu Cys Asn Thr
  370          375          380
Asp Ile Phe Asn Ser Lys Tyr Asp Cys Lys Ile Met Thr Ser Lys Thr
 385          390          395          400
Asp Ile Ser Ser Ser Val Ile Thr Ser Leu Gly Ala Ile Val Ser Cys
          405          410          415
Tyr Gly Lys Thr Lys Cys Thr Ala Ser Asn Lys Asn Arg Gly Ile Ile
          420          425          430

Lys Thr Phe Ser Asn Gly Cys Asp Tyr Val Ser Asn Lys Gly Val Asp
  435          440          445
Thr Val Ser Val Gly Asn Thr Leu Tyr Tyr Val Asn Lys Leu Glu Gly
  450          455          460
Lys Asn Leu Tyr Val Lys Gly Glu Pro Ile Ile Asn Tyr Tyr Asp Pro
 465          470          475          480
Leu Val Phe Pro Ser Asp Glu Phe Asp Ala Ser Ile Ser Gln Val Asn
          485          490          495
Glu Lys Ile Asn Gln Ser Leu Ala Phe Ile Arg Arg Ser Asp Glu Leu
          500          505          510
Leu His Asn Val Asn Thr Gly Lys Ser Thr Thr Asn Ile Met Ile Thr
          515          520          525
Thr Ile Ile Ile Val Ile Ile Val Val Leu Leu Ser Leu Ile Ala Ile
          530          535          540
Gly Leu Leu Leu Tyr Cys Lys Ala Lys Asn Thr Pro Val Thr Leu Ser
 545          550          555          560
Lys Asp Gln Leu Ser Gly Ile Asn Asn Ile Ala Phe Ser Lys
          565          570

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<210> 7
 <211> 574
 <212> PRT
 <213> paramyxovirus

<220>
 <223> paramyxovirus F protein hRSV A2

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<400> 7
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          20          25          30
Tyr Gln Ser Thr Cys Ser Ala Val Ser Lys Gly Tyr Leu Ser Ala Leu
          35          40          45
Arg Thr Gly Trp Tyr Thr Ser Val Ile Thr Ile Glu Leu Ser Asn Ile
          50          55          60
Lys Glu Asn Lys Cys Asn Gly Thr Asp Ala Lys Val Lys Leu Ile Lys
 65          70          75          80
Gln Glu Leu Asp Lys Tyr Lys Asn Ala Val Thr Glu Leu Gln Leu Leu
          85          90          95
Met Gln Ser Thr Pro Pro Thr Asn Asn Arg Ala Arg Arg Glu Leu Pro
          100          105          110
Arg Phe Met Asn Tyr Thr Leu Asn Asn Ala Lys Lys Thr Asn Val Thr
          115          120          125
Leu Ser Lys Lys Arg Lys Arg Arg Phe Leu Gly Phe Leu Leu Gly Val
          130          135          140
Gly Ser Ala Ile Ala Ser Gly Val Ala Val Ser Lys Val Leu His Leu
 145          150          155          160
Glu Gly Glu Val Asn Lys Ile Lys Ser Ala Leu Leu Ser Thr Asn Lys
          165          170          175
Ala Val Val Ser Leu Ser Asn Gly Val Ser Val Leu Thr Ser Lys Val

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1           5           10           15
Ser Cys Ser Thr Ile Thr Glu Gly Tyr Leu Ser Val Leu Arg Thr Gly
20           25           30
Trp Tyr Thr Asn Val Phe Thr Leu Glu Val Gly Asp Val Glu Asn Leu
35           40           45

Thr Cys Ala Asp Gly Pro Ser Leu Ile Lys Thr Glu Leu Asp Leu Thr
50           55           60
Lys Ser Ala Leu Arg Glu Leu Arg Thr Val Ser Ala Asp Gln Leu Ala
65           70           75           80
Arg Glu Glu Gln Ile Glu Asn Pro Arg Gln Ser Arg Phe Val Leu Gly
85           90           95
Ala Ile Ala Leu Gly Val Ala Thr Ala Ala Val Thr Ala Gly Val
100           105           110
Ala Ile Ala Lys Thr Ile Arg Leu Glu
115           120

```

<210> 9

<211> 539

<212> PRT

<213> metapneumovirus

<220>

<223> Human metapneumovirus isolate 00-1 matrix protein
(M) and fusion protein (F) genes

<400> 9

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Met Ser Trp Lys Val Val Ile Ile Phe Ser Leu Leu Ile Thr Pro Gln
1           5           10           15
His Gly Leu Lys Glu Ser Tyr Leu Glu Glu Ser Cys Ser Thr Ile Thr
20           25           30
Glu Gly Tyr Leu Ser Val Leu Arg Thr Gly Trp Tyr Thr Asn Val Phe
35           40           45
Thr Leu Glu Val Gly Asp Val Glu Asn Leu Thr Cys Ala Asp Gly Pro
50           55           60
Ser Leu Ile Lys Thr Glu Leu Asp Leu Thr Lys Ser Ala Leu Arg Glu
65           70           75           80
Leu Arg Thr Val Ser Ala Asp Gln Leu Ala Arg Glu Glu Gln Ile Glu
85           90           95
Asn Pro Arg Gln Ser Arg Phe Val Leu Gly Ala Ile Ala Leu Gly Val
100           105           110
Ala Thr Ala Ala Ala Val Thr Ala Gly Val Ala Ile Ala Lys Thr Ile
115           120           125
Arg Leu Glu Ser Glu Val Thr Ala Ile Lys Asn Ala Leu Lys Lys Thr
130           135           140
Asn Glu Ala Val Ser Thr Leu Gly Asn Gly Val Arg Val Leu Ala Thr
145           150           155           160
Ala Val Arg Glu Leu Lys Asp Phe Val Ser Lys Asn Leu Thr Arg Ala
165           170           175
Ile Asn Lys Asn Lys Cys Asp Ile Ala Asp Leu Lys Met Ala Val Ser
180           185           190
Phe Ser Gln Phe Asn Arg Arg Phe Leu Asn Val Val Arg Gln Phe Ser
195           200           205
Asp Asn Ala Gly Ile Thr Pro Ala Ile Ser Leu Asp Leu Met Thr Asp
210           215           220
Ala Glu Leu Ala Arg Ala Val Ser Asn Met Pro Thr Ser Ala Gly Gln
225           230           235           240
Ile Lys Leu Met Leu Glu Asn Arg Ala Met Val Arg Arg Lys Gly Phe
245           250           255
Gly Phe Leu Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln

```


| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Arg | Leu | Glu | Gly | Glu | Val | Ala | Ala | Ile | Lys | Gly | Ala | Leu | Arg | Lys | Thr |
| 130 | | | | | | 135 | | | | | 140 | | | | |
| Asn | Glu | Ala | Val | Ser | Thr | Leu | Gly | Asn | Gly | Val | Arg | Val | Leu | Ala | Thr |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Ala | Val | Asn | Asp | Leu | Lys | Asp | Phe | Ile | Ser | Lys | Lys | Leu | Thr | Pro | Ala |
| | | | 165 | | | | | | 170 | | | | | 175 | |
| Ile | Asn | Arg | Asn | Lys | Cys | Asp | Ile | Ser | Asp | Leu | Lys | Met | Ala | Val | Ser |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Phe | Gly | Gln | Tyr | Asn | Arg | Arg | Phe | Leu | Asn | Val | Val | Arg | Gln | Phe | Ser |
| | 195 | | | | | 200 | | | | | | 205 | | | |
| Asp | Asn | Ala | Gly | Ile | Thr | Pro | Ala | Ile | Ser | Leu | Asp | Leu | Met | Thr | Asp |
| 210 | | | | | 215 | | | | | | 220 | | | | |
| Ala | Glu | Leu | Val | Arg | Ala | Val | Ser | Asn | Met | Pro | Thr | Ser | Ser | Gly | Gln |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 |
| Ile | Asn | Leu | Met | Leu | Glu | Asn | Arg | Ala | Met | Val | Arg | Arg | Lys | Gly | Phe |
| | | | 245 | | | | | | 250 | | | | | 255 | |
| Gly | Ile | Leu | Ile | Gly | Val | Tyr | Gly | Ser | Ser | Val | Val | Tyr | Ile | Val | Gln |
| | | 260 | | | | | | 265 | | | | | 270 | | |
| Leu | Pro | Ile | Phe | Gly | Val | Ile | Asp | Thr | Pro | Cys | Trp | Arg | Val | Lys | Ala |
| | 275 | | | | | | 280 | | | | | 285 | | | |
| Ala | Pro | Leu | Cys | Ser | Gly | Lys | Asp | Gly | Asn | Tyr | Ala | Cys | Leu | Leu | Arg |
| 290 | | | | | | 295 | | | | | 300 | | | | |
| Glu | Asp | Gln | Gly | Trp | Tyr | Cys | Gln | Asn | Ala | Gly | Ser | Thr | Val | Tyr | Tyr |
| 305 | | | | | 310 | | | | | 315 | | | | | 320 |
| Pro | Asn | Glu | Glu | Asp | Cys | Glu | Val | Arg | Ser | Asp | His | Val | Phe | Cys | Asp |
| | | | 325 | | | | | | 330 | | | | 335 | | |
| Thr | Ala | Ala | Gly | Ile | Asn | Val | Ala | Lys | Glu | Ser | Glu | Glu | Cys | Asn | Arg |
| | | 340 | | | | | | 345 | | | | | 350 | | |
| Asn | Ile | Ser | Thr | Thr | Lys | Tyr | Pro | Cys | Lys | Val | Ser | Thr | Gly | Arg | His |
| | 355 | | | | | | 360 | | | | | 365 | | | |
| Pro | Ile | Ser | Met | Val | Ala | Leu | Ser | Pro | Leu | Gly | Ala | Leu | Val | Ala | Cys |
| 370 | | | | | | 375 | | | | | 380 | | | | |
| Tyr | Asp | Gly | Met | Ser | Cys | Ser | Ile | Gly | Ser | Asn | Lys | Val | Gly | Ile | Ile |
| 385 | | | | | 390 | | | | | 395 | | | | | 400 |
| Arg | Pro | Leu | Gly | Lys | Gly | Cys | Ser | Tyr | Ile | Ser | Asn | Gln | Asp | Ala | Asp |
| | | | 405 | | | | | | 410 | | | | | 415 | |
| Thr | Val | Thr | Ile | Asp | Asn | Thr | Val | Tyr | Gln | Leu | Ser | Lys | Val | Glu | Gly |
| | | 420 | | | | | | 425 | | | | | 430 | | |
| Glu | Gln | His | Thr | Ile | Lys | Gly | Lys | Pro | Val | Ser | Ser | Asn | Phe | Asp | Pro |
| | | 435 | | | | | 440 | | | | | 445 | | | |
| Ile | Glu | Phe | Pro | Glu | Asp | Gln | Phe | Asn | Val | Ala | Leu | Asp | Gln | Val | Phe |
| | 450 | | | | | 455 | | | | | 460 | | | | |
| Glu | Ser | Val | Glu | Lys | Ser | Gln | Asn | Leu | Ile | Asp | Gln | Ser | Asn | Lys | Ile |
| 465 | | | | | 470 | | | | | 475 | | | | | 480 |
| Leu | Asp | Ser | Ile | Glu | Lys | Gly | Asn | Ala | Gly | Phe | Val | Ile | Val | Ile | Val |
| | | | 485 | | | | | | 490 | | | | | 495 | |
| Leu | Ile | Val | Leu | Leu | Met | Leu | Ala | Ala | Val | Gly | Val | Gly | Val | Phe | Phe |
| | | 500 | | | | | | 505 | | | | | 510 | | |
| Val | Val | Lys | Lys | Arg | Lys | Ala | Ala | Pro | Lys | Phe | Pro | Met | Glu | Met | Asn |
| | | 515 | | | | | 520 | | | | | 525 | | | |
| Gly | Val | Asn | Asn | | | | | | | | | | | | |
| 530 | | | | | | | | | | | | | | | |

<210> 11

<211> 537

<212> PRT

<213> Avian pneumovirus

<220>

<223> Avian pneumovirus isolate 1b fusion protein mRNA,
complete cds

```

<400> 11
Met Ser Trp Lys Val Val Leu Leu Leu Val Leu Leu Ala Thr Pro Thr
 1          5          10          15
Gly Gly Leu Glu Glu Ser Tyr Leu Glu Glu Ser Cys Ser Thr Val Thr
 20          25          30
Arg Gly Tyr Leu Ser Val Leu Arg Thr Gly Trp Tyr Thr Asn Val Phe
 35          40          45
Thr Leu Glu Val Gly Asp Val Glu Asn Leu Thr Cys Thr Asp Gly Pro
 50          55          60
Ser Leu Ile Arg Thr Glu Leu Glu Leu Thr Lys Asn Ala Leu Glu Glu
 65          70          75          80
Leu Lys Thr Val Ser Ala Asp Gln Leu Ala Lys Glu Ala Arg Ile Met
 85          90          95
Ser Pro Arg Lys Ala Arg Phe Val Leu Gly Ala Ile Ala Leu Gly Val
100          105          110

Ala Thr Ala Ala Ala Val Thr Ala Gly Val Ala Ile Ala Lys Thr Ile
115          120          125
Arg Leu Glu Gly Glu Val Ala Ala Ile Lys Gly Ala Leu Arg Lys Thr
130          135          140
Asn Glu Ala Val Ser Thr Leu Gly Asn Gly Val Arg Val Leu Ala Thr
145          150          155          160
Ala Val Asn Asp Leu Lys Asp Phe Ile Ser Lys Lys Leu Thr Pro Ala
165          170          175
Ile Asn Arg Asn Lys Cys Asp Ile Ser Asp Leu Lys Met Ala Val Ser
180          185          190
Phe Gly Gln Tyr Asn Arg Arg Phe Leu Asn Val Val Arg Gln Phe Ser
195          200          205
Asp Asn Ala Gly Ile Thr Pro Ala Ile Ser Leu Asp Leu Met Thr Asp
210          215          220
Ala Glu Leu Val Arg Ala Val Ser Asn Met Pro Thr Ser Ser Gly Gln
225          230          235          240
Ile Asn Leu Met Leu Glu Asn Arg Ala Met Val Arg Arg Lys Gly Phe
245          250          255
Gly Ile Leu Ile Gly Val Tyr Gly Ser Ser Val Val Tyr Ile Val Gln
260          265          270
Leu Pro Ile Phe Gly Val Ile Asp Thr Pro Cys Trp Lys Val Lys Ala
275          280          285
Ala Pro Leu Cys Ser Gly Lys Asp Gly Asn Tyr Ala Cys Leu Leu Arg
290          295          300
Glu Asp Gln Gly Trp Tyr Cys Gln Asn Ala Gly Ser Thr Val Tyr Tyr
305          310          315          320
Pro Asn Glu Glu Asp Cys Glu Val Arg Ser Asp His Val Phe Cys Asp
325          330          335
Thr Ala Ala Gly Ile Asn Val Ala Lys Glu Ser Glu Glu Cys Asn Arg
340          345          350
Asn Ile Ser Thr Thr Lys Tyr Pro Cys Lys Val Ser Thr Gly Arg His
355          360          365
Pro Ile Ser Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys
370          375          380
Tyr Asp Gly Met Ser Cys Ser Ile Gly Ser Asn Lys Val Gly Ile Ile
385          390          395          400
Arg Pro Leu Gly Lys Gly Cys Ser Tyr Ile Ser Asn Gln Asp Ala Asp
405          410          415
Thr Val Thr Ile Asp Asn Thr Val Tyr Gln Leu Ser Lys Val Glu Gly
420          425          430
Glu Gln His Thr Ile Lys Gly Lys Pro Val Ser Ser Asn Phe Asp Pro
435          440          445
Ile Glu Phe Pro Glu Asp Gln Phe Asn Val Ala Leu Asp Gln Val Phe
450          455          460

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Glu Ser Val Glu Lys Ser Gln Asn Leu Ile Asp Gln Ser Asn Lys Ile
 465 470 475 480
 Leu Asp Ser Ile Glu Lys Gly Asn Ala Gly Phe Val Ile Val Ile Val
 485 490 495
 Leu Ile Val Leu Leu Met Leu Ala Ala Val Gly Val Gly Val Phe Phe
 500 505 510
 Val Val Lys Lys Arg Lys Ala Ala Pro Lys Phe Pro Met Glu Met Asn
 515 520 525
 Gly Val Asn Asn Lys Gly Phe Ile Pro
 530 535

<210> 12
 <211> 538
 <212> PRT
 <213> Turkey rhinotracheitis virus

<220>
 <223> Turkey rhinotracheitis virus gene for fusion
 protein (F1 and F2 subunits), complete cds

<400> 12
 Met Asp Val Arg Ile Cys Leu Leu Leu Phe Leu Ile Ser Asn Pro Ser
 1 5 10 15
 Ser Cys Ile Gln Glu Thr Tyr Asn Glu Glu Ser Cys Ser Thr Val Thr
 20 25 30
 Arg Gly Tyr Lys Ser Val Leu Arg Thr Gly Trp Tyr Thr Asn Val Phe
 35 40 45
 Asn Leu Glu Ile Gly Asn Val Glu Asn Ile Thr Cys Asn Asp Gly Pro
 50 55 60
 Ser Leu Ile Asp Thr Glu Leu Val Leu Thr Lys Asn Ala Leu Arg Glu
 65 70 75 80
 Leu Lys Thr Val Ser Ala Asp Gln Val Ala Lys Glu Ser Arg Leu Ser
 85 90 95
 Ser Pro Arg Arg Arg Arg Phe Val Leu Gly Ala Ile Ala Leu Gly Val
 100 105 110
 Ala Thr Ala Ala Ala Val Thr Ala Gly Val Ala Leu Ala Lys Thr Ile
 115 120 125
 Arg Leu Glu Gly Glu Val Lys Ala Ile Lys Asn Ala Leu Arg Asn Thr
 130 135 140
 Asn Glu Ala Val Ser Thr Leu Gly Asn Gly Val Arg Val Leu Ala Thr
 145 150 155 160
 Ala Val Asn Asp Leu Lys Glu Phe Ile Ser Lys Lys Leu Thr Pro Ala
 165 170 175
 Ile Asn Gln Asn Lys Cys Asn Ile Ala Asp Ile Lys Met Ala Ile Ser
 180 185 190
 Phe Gly Gln Asn Asn Arg Arg Phe Leu Asn Val Val Arg Gln Phe Ser
 195 200 205
 Asp Ser Ala Gly Ile Thr Ser Ala Val Ser Leu Asp Leu Met Thr Asp
 210 215 220
 Asp Glu Leu Val Arg Ala Ile Asn Arg Met Pro Thr Ser Ser Gly Gln
 225 230 235 240
 Ile Ser Leu Met Leu Asn Asn Arg Ala Met Val Arg Arg Lys Gly Phe
 245 250 255
 Gly Ile Leu Ile Gly Val Tyr Asp Gly Thr Val Val Tyr Met Val Gln
 260 265 270
 Leu Pro Ile Phe Gly Val Ile Glu Thr Pro Cys Trp Arg Val Val Ala
 275 280 285
 Ala Pro Leu Cys Arg Lys Glu Lys Gly Asn Tyr Ala Cys Ile Leu Arg
 290 295 300
 Glu Asp Gln Gly Trp Tyr Cys Thr Asn Ala Gly Ser Thr Ala Tyr Tyr
 305 310 315 320

Pro Asn Lys Asp Asp Cys Glu Val Arg Asp Asp Tyr Val Phe Cys Asp
 325 330 335
 Thr Ala Ala Gly Ile Asn Val Ala Leu Glu Val Glu Gln Cys Asn Tyr
 340 345 350
 Asn Ile Ser Thr Ser Lys Tyr Pro Cys Lys Val Ser Thr Gly Arg His
 355 360 365
 Pro Val Ser Met Val Ala Leu Thr Pro Leu Gly Gly Leu Val Ser Cys
 370 375 380
 Tyr Glu Ser Val Ser Cys Ser Ile Gly Ser Asn Lys Val Gly Ile Ile
 385 390 395 400
 Lys Gln Leu Gly Lys Gly Cys Thr His Ile Pro Asn Asn Glu Ala Asp
 405 410 415
 Thr Ile Thr Ile Asp Asn Thr Val Tyr Gln Leu Ser Lys Val Val Gly
 420 425 430
 Glu Gln Arg Thr Ile Lys Gly Ala Pro Val Val Asn Asn Phe Asn Pro
 435 440 445
 Ile Leu Phe Pro Glu Asp Gln Phe Asn Val Ala Leu Asp Gln Val Phe
 450 455 460

 Glu Ser Ile Asp Arg Ser Gln Asp Leu Ile Asp Lys Ser Asn Asp Leu
 465 470 475 480
 Leu Gly Ala Asp Ala Lys Ser Lys Ala Gly Ile Ala Ile Ala Ile Val
 485 490 495
 Val Leu Val Ile Leu Gly Ile Phe Phe Leu Leu Ala Val Ile Tyr Tyr
 500 505 510
 Cys Ser Arg Val Arg Lys Thr Lys Pro Lys His Asp Tyr Pro Ala Thr
 515 520 525
 Thr Gly His Ser Ser Met Ala Tyr Val Ser
 530 535

<210> 13
 <211> 537
 <212> PRT
 <213> Avian penumovirus

<220>
 <223> Avian pneumovirus fusion glycoprotein (F) gene,
 complete cds

<400> 13
 Met Ser Trp Lys Val Val Leu Leu Leu Val Leu Leu Ala Thr Pro Thr
 1 5 10 15
 Gly Gly Leu Glu Glu Ser Tyr Leu Glu Glu Ser Cys Ser Thr Val Thr
 20 25 30
 Arg Gly Tyr Leu Ser Val Leu Arg Thr Gly Trp Tyr Thr Asn Val Phe
 35 40 45
 Thr Leu Glu Val Gly Asp Val Glu Asn Leu Thr Cys Thr Asp Gly Pro
 50 55 60
 Ser Leu Ile Arg Thr Glu Leu Glu Leu Thr Lys Asn Ala Leu Glu Glu
 65 70 75 80
 Leu Lys Thr Val Ser Ala Asp Gln Leu Ala Lys Glu Ala Arg Ile Met
 85 90 95
 Ser Pro Arg Lys Ala Arg Phe Val Leu Gly Ala Ile Ala Leu Gly Val
 100 105 110
 Ala Thr Ala Ala Val Thr Ala Gly Val Ala Ile Ala Lys Thr Ile
 115 120 125
 Arg Leu Glu Gly Glu Val Ala Ala Ile Lys Gly Ala Leu Arg Lys Thr
 130 135 140
 Asn Glu Ala Val Ser Thr Leu Gly Asn Gly Val Arg Val Leu Ala Thr
 145 150 155 160
 Ala Val Asn Asp Leu Lys Asp Phe Ile Ser Lys Lys Leu Thr Pro Ala

| | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ile | Asn | Arg | Asn | 165 | Lys | Cys | Asp | Ile | Ser | 170 | Asp | Leu | Lys | Met | 175 | Ala | Val | Ser |
| | | | 180 | | | | | | 185 | | | | | | 190 | | | |
| Phe | Gly | Gln | Tyr | Asn | Arg | Arg | Phe | Leu | Asn | Val | Val | Arg | Gln | Phe | Ser | | | |
| | | 195 | | | | | 200 | | | | | | | 205 | | | | |
| Asp | Asn | Ala | Gly | Ile | Thr | Pro | Ala | Ile | Ser | Leu | Asp | Leu | Met | Thr | Asp | | | |
| | | 210 | | | | 215 | | | | | 220 | | | | | | | |
| Ala | Glu | Leu | Val | Arg | Ala | Val | Ser | Asn | Met | Pro | Thr | Ser | Ser | Gly | Gln | | | |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 | | | |
| Ile | Asn | Leu | Met | Leu | Glu | Asn | Arg | Ala | Met | Val | Arg | Arg | Lys | Gly | Phe | | | |
| | | | 245 | | | | | | 250 | | | | | | 255 | | | |
| Gly | Ile | Leu | Ile | Gly | Val | Tyr | Gly | Ser | Ser | Val | Val | Tyr | Ile | Val | Gln | | | |
| | | 260 | | | | | | 265 | | | | | | 270 | | | | |
| Leu | Pro | Ile | Phe | Gly | Val | Ile | Asp | Thr | Pro | Cys | Trp | Lys | Val | Lys | Ala | | | |
| | | 275 | | | | | 280 | | | | | | 285 | | | | | |
| Ala | Pro | Leu | Cys | Ser | Gly | Lys | Asp | Gly | Asn | Tyr | Ala | Cys | Leu | Leu | Arg | | | |
| | | 290 | | | | 295 | | | | | 300 | | | | | | | |
| Glu | Asp | Gln | Gly | Trp | Tyr | Cys | Gln | Asn | Ala | Gly | Ser | Thr | Val | Tyr | Tyr | | | |
| 305 | | | | | 310 | | | | | 315 | | | | | 320 | | | |
| | | | | | | | | | | | | | | | | | | |
| Pro | Asn | Glu | Glu | Asp | Cys | Glu | Val | Arg | Ser | Asp | His | Val | Phe | Cys | Asp | | | |
| | | | | 325 | | | | | 330 | | | | | 335 | | | | |
| Thr | Ala | Ala | Gly | Ile | Asn | Val | Ala | Lys | Glu | Ser | Glu | Glu | Cys | Asn | Arg | | | |
| | | | 340 | | | | | 345 | | | | | | 350 | | | | |
| Asn | Ile | Ser | Thr | Thr | Lys | Tyr | Pro | Cys | Lys | Val | Ser | Thr | Gly | Arg | His | | | |
| | | 355 | | | | | 360 | | | | | | | 365 | | | | |
| Pro | Ile | Ser | Met | Val | Ala | Leu | Ser | Pro | Leu | Gly | Ala | Leu | Val | Ala | Cys | | | |
| | | 370 | | | | 375 | | | | | 380 | | | | | | | |
| Tyr | Asp | Gly | Met | Ser | Cys | Ser | Ile | Gly | Ser | Asn | Lys | Val | Gly | Ile | Ile | | | |
| 385 | | | | | 390 | | | | | 395 | | | | | 400 | | | |
| Arg | Pro | Leu | Gly | Lys | Gly | Cys | Ser | Tyr | Ile | Ser | Asn | Gln | Asp | Ala | Asp | | | |
| | | | 405 | | | | | | 410 | | | | | 415 | | | | |
| Thr | Val | Thr | Ile | Asp | Asn | Thr | Val | Tyr | Gln | Leu | Ser | Lys | Val | Glu | Gly | | | |
| | | | 420 | | | | | 425 | | | | | | 430 | | | | |
| Glu | Gln | His | Thr | Ile | Lys | Gly | Lys | Pro | Val | Ser | Ser | Asn | Phe | Asp | Pro | | | |
| | | 435 | | | | | 440 | | | | | | 445 | | | | | |
| Ile | Glu | Phe | Pro | Glu | Asp | Gln | Phe | Asn | Ile | Ala | Leu | Asp | Gln | Val | Phe | | | |
| | | 450 | | | | 455 | | | | | 460 | | | | | | | |
| Glu | Ser | Val | Glu | Lys | Ser | Gln | Asn | Leu | Ile | Asp | Gln | Ser | Asn | Lys | Ile | | | |
| 465 | | | | | 470 | | | | | 475 | | | | | 480 | | | |
| Leu | Asp | Ser | Ile | Glu | Lys | Gly | Asn | Ala | Gly | Phe | Val | Ile | Val | Ile | Val | | | |
| | | | 485 | | | | | | 490 | | | | | 495 | | | | |
| Leu | Ile | Val | Leu | Leu | Met | Leu | Ala | Ala | Val | Gly | Val | Gly | Val | Phe | Phe | | | |
| | | | 500 | | | | 505 | | | | | | | 510 | | | | |
| Val | Val | Lys | Arg | Lys | Ala | Ala | Pro | Lys | Phe | Pro | Met | Glu | Met | Asn | | | | |
| | | 515 | | | | 520 | | | | | 525 | | | | | | | |
| Gly | Val | Asn | Asn | Lys | Gly | Phe | Ile | Pro | | | | | | | | | | |
| | | 530 | | | | 535 | | | | | | | | | | | | |

<210> 14

<211> 1193

<212> DNA

<213> rhinotracheitis virus

<220>

<221> CDS

<222> (16)...(1191)

<223> Turkey rhinotracheitis virus (strain CVL14/1)
attachment protien (G) mRNA, complete cds

<400> 14

```

gggacaagta tctctatggg gtccaaacta tatatggctc agggcaccag tgcatatcaa 60
actgcagtgg ggttctggct ggacatcggg aggaggtaca tattggctat agtcctatca 120
gctttcgggc tgacctgcac agtcactatt gcactcactg ttagcgctcat agttgaacag 180
tcagtgttag aggagtgcag aaactacaat ggaggagata gagattgggtg gtcaaccacc 240
caggagcagc caactactgc accaagtgcg actccagcag gaaattatgg aggattacaa 300
acggctcgaa caagaaagtc tgaaagctgt ttgcatgtgc aaattttctta tggatgatag 360
tatagccgca gtgatactgt actgggtgggt tttgattgta tgggcttatt ggttctttgc 420
aaatcaggac caatttgtca gcgagataat caagttgacc caacagccct ctgccattgc 480
agggtagatc tttcaagtgt ggactgctgc aagggtgaaca agattagcac taacagcagc 540
accacctctg agccccagaa gaccaaccgg gcatggccta gccaaagaaa cacagactcc 600
gatccaaatc cccaaggcat aaccaccagc acagccactc tgctctcaac aagtctgggc 660
ctcatgtctc catcgaaagac tgggacacac aaatcagggc ccccccaagc cttgccgggg 720
agcaaacacca acggaaaaaac aaccacagac cgagaaccag ggcccaaaa ccaaccaaat 780
tcaaccacca atgggcaaca caataaacac acccaacgaa tgacaccccc gccaaagtcac 840
gacaacacaa gaaccatcct ccagcacaca acaccctggg aaaagacatt cagtacatac 900
aagcccacac actctccgac caacgaatca gatcaatccc tccccacaa tcaaaacagc 960
atcaactgtg aacattttga ccccaaggc aaggaaaaaa tctgctacag agtaggttct 1020
tacaactcca atattacaaa gcaatgcaga attgatgtgc ctttgtgttc cacttatagc 1080
acagtgtgca tgaaaacata ctataccgaa ccattcaact gttggaggcg tatctggcgt 1140
tgcttgtgtg atgacggagt tggctctggt gagtgggtgt gcactagtta act 1193

```

```

<210> 15
<211> 1260
<212> DNA
<213> rhinotracheitis virus

<220>
<221> CDS
<222> (16)...(1260)
<223> Turkey rhinotracheitis virus (strain 6574)
        attachment protein (G), complete cds

```

```

<400> 15
gggacaagta tccagatggg gtcagagctc tacatcatag aggggggtgag ctcatctgaa 60
atagtcctca agcaagtcct cagaaggagc caaaaaatac tgtaggact ggtgttatca 120
gccttaggct tgacgctcac tagcactatt gttatatcta tttgtattag tgtagaacag 180
gtcaaaattac gacagtgtgt ggacacttat tgggcggaaa atggatcctt acatccagga 240
cagtcaacag aaaatacttc aacaagaggt aagactacaa caaaagacct tagaagatta 300
caggcgactg gagcaggaaa gtttgagagc tgtgggtatg tgcaagttgt tgatgggtgat 360
atgcatgata gcagttatgc tgtactgggt ggtgttgatt gtttgggctt attggctctt 420
tgtgaatcag gaccaatttg tcaggggagat acttgggtctg aagacggaaa cttctgccga 480
tgcacttttt cttcccatgg ggtgagttgc tgcaaaaaaac ccaaagcaa ggcaaccact 540
gccagagga actccaaacc agctaacagc aaatcaactc ctccgttaca ttcagacagg 600
gccagcaaag aacataatcc ctcccaaggg gagcaacccc gcagggggcc aaccagcagc 660
aagacaacta ttgctagcac cccttcaaca gaggacactg ctaaaccac gattagcaaa 720
cctaaactca ccatcaggcc ctcgcaaaga ggtccatccg gcagcacaaa agcagcctcc 780
agcaccacca gccacaagac caacaccaga ggcaccagca agacgaccga ccagagacc 840
cgcaccggac ccactcccga aaggcccaga caaaccaca gcacagcaac tccgcccccc 900
acaaccccaa tccacaaggg ccgggccccca acccccaaac caacaacaga cctcaaggtc 960
aacccaaggg aaggcagcac aagcccaact gcaatacaga aaaacccaac cacacaaagt 1020
aatcttgttg actgcacact gtctgatcca gatgagccac aaaggatttg ttaccaggta 1080
ggaacttaca atcctagtca atcggaacc tgcaacatag aggttccaaa atgttccact 1140
tatgggcatg cttgtatggc tacattatat gacaccccat tcaactgctg gcgcaggacc 1200
aggagatgca tctgtgatcc cggagggggag ctgattgagt ggtgctgtac tagtcaataa 1260

```

```

<210> 16
<211> 391
<212> PRT
<213> Turkey rhinotracheitis virus

<220>

```

<223> Turkey rhinotracheitis virus (strain CVL14/1)
attachment protien (G) mRNA, complete cds

<400> 16

```

Met Gly Ser Lys Leu Tyr Met Ala Gln Gly Thr Ser Ala Tyr Gln Thr
 1           5           10           15
Ala Val Gly Phe Trp Leu Asp Ile Gly Arg Arg Tyr Ile Leu Ala Ile
          20           25           30
Val Leu Ser Ala Phe Gly Leu Thr Cys Thr Val Thr Ile Ala Leu Thr
          35           40           45
Val Ser Val Ile Val Glu Gln Ser Val Leu Glu Glu Cys Arg Asn Tyr
          50           55           60
Asn Gly Gly Asp Arg Asp Trp Trp Ser Thr Thr Gln Glu Gln Pro Thr
65           70           75           80
Thr Ala Pro Ser Ala Thr Pro Ala Gly Asn Tyr Gly Gly Leu Gln Thr
          85           90           95
Ala Arg Thr Arg Lys Ser Glu Ser Cys Leu His Val Gln Ile Ser Tyr
          100          105          110
Gly Asp Met Tyr Ser Arg Ser Asp Thr Val Leu Gly Gly Phe Asp Cys
          115          120          125
Met Gly Leu Leu Val Leu Cys Lys Ser Gly Pro Ile Cys Gln Arg Asp
          130          135          140
Asn Gln Val Asp Pro Thr Ala Leu Cys His Cys Arg Val Asp Leu Ser
145          150          155          160
Ser Val Asp Cys Cys Lys Val Asn Lys Ile Ser Thr Asn Ser Ser Thr
          165          170          175
Thr Ser Glu Pro Gln Lys Thr Asn Pro Ala Trp Pro Ser Gln Asp Asn
          180          185          190
Thr Asp Ser Asp Pro Asn Pro Gln Gly Ile Thr Thr Ser Thr Ala Thr
          195          200          205
Leu Leu Ser Thr Ser Leu Gly Leu Met Leu Thr Ser Lys Thr Gly Thr
          210          215          220
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Lys Thr Thr Thr Asp Arg Glu Pro Gly Pro Thr Asn Gln Pro Asn Ser
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Pro Ser His Asp Asn Thr Arg Thr Ile Leu Gln His Thr Thr Pro Trp
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Glu Lys Thr Phe Ser Thr Tyr Lys Pro Thr His Ser Pro Thr Asn Glu
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Phe Asp Pro Gln Gly Lys Glu Lys Ile Cys Tyr Arg Val Gly Ser Tyr
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Thr Tyr Ser Thr Val Cys Met Lys Thr Tyr Tyr Thr Glu Pro Phe Asn
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<220>

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attachment protein (G), complete cds

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Val Leu Ser Ala Leu Gly Leu Thr Leu Thr Ser Thr Ile Val Ile Ser
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| gatgtgggta | caacaactgc | agtgcacccc | tcatacttgc | aacaagaaat | aacactgttg | 180 |
| tgtggagaaa | ttctgtatgc | taaacatgct | gactacaaat | atgctgcaga | aataggaata | 240 |
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aagcccaaaa gctggattgt ttagccaatt gtccaactt tgcaagggtc tcggcaatgc 60
ctcagg 66

<210> 43

<211> 66
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 43
aagcccaaaa gctggactgt ttagccaatt gtcccaactt tgctaggttc tcggcaatgc 60
ctcagg 66

<210> 44
<211> 66
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 44
aagtccaaag gcagggctgt ttggccaatt gccccaattt tgctaggttc ttggcaatgc 60
ttcagg 66

<210> 45
<211> 66
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 45
aagtccaaag gcagggctgt ttggccaatt gccccaattt tgctaggttc ttggcaatgc 60
ttcagg 66

<210> 46
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 46
cccaccacca gagagaaa 18

<210> 47
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 47
accaccagag agaaaccc 18

<210> 48
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
 <223> Primer

 <400> 48
 accagagaga aacccacc 18

 <210> 49
 <211> 18
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 <220>
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 <400> 49
 agagagaaac ccaccacc 18

 <210> 50
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 <220>
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 <400> 50
 gagaaacca ccaccaga 18

 <210> 51
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 <220>
 <223> Primer

 <400> 51
 aaaccacca ccagagag 18

 <210> 52
 <211> 18
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Primer

 <400> 52
 ggaggcaagc gaacgcaa 18

 <210> 53
 <211> 18
 <212> DNA
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 <220>
 <223> Primer

 <400> 53
 ggcaagcgaa cgcaagga 18

<210> 54
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 54
aagcgaacgc aaggaggc 18

<210> 55
<211> 18
<212> DNA
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<220>
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<400> 55
cgaacgcaag gaggaag 18

<210> 56
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 56
acgcaaggag gcaagcga 18

<210> 57
<211> 18
<212> DNA
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<220>
<223> Primer

<400> 57
caaggaggca agcgaacg 18

<210> 58
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 58
tggtgtcgag actattccaa 20

<210> 59
<211> 20
<212> DNA
<213> Artificial Sequence

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| <220> | |
| <223> Primer | |
| <400> 59 | |
| tgttgwacca gttgcagtct | 20 |
| <210> 60 | |
| <211> 23 | |
| <212> DNA | |
| <213> Artificial Sequence | |
| <220> | |
| <223> Primer | |
| <400> 60 | |
| tgctgcttct attgagaaac gcc | 23 |
| <210> 61 | |
| <211> 20 | |
| <212> DNA | |
| <213> Artificial Sequence | |
| <220> | |
| <223> Primer | |
| <400> 61 | |
| ggtgacttcy aatagggcca | 20 |
| <210> 62 | |
| <211> 21 | |
| <212> DNA | |
| <213> Artificial Sequence | |
| <220> | |
| <223> Primer | |
| <400> 62 | |
| ctcgagggttg tcaggatata g | 21 |
| <210> 63 | |
| <211> 21 | |
| <212> DNA | |
| <213> Artificial Sequence | |
| <220> | |
| <223> Primer | |
| <400> 63 | |
| ctttgggagt tgaacacagt t | 21 |
| <210> 64 | |
| <211> 20 | |
| <212> DNA | |
| <213> Artificial Sequence | |
| <220> | |
| <223> Primer | |
| <400> 64 | |
| ttcrgtttta gctgcttacg | 20 |

<210> 65
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 65
aggcaaattct ctggataatg c

21

<210> 66
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 66
tcgtaacgtc tcgtgacc

18

<210> 67
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 67
ggagatcttt ctagagtgag

20

<210> 68
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<220>
<221> misc_feature
<222> 10, 19
<223> n = A,T,C or G

<220>
<221> misc_feature
<222> 10, 19
<223> n = A,T,C or G

<400> 68
ccttggtgan tctatccgna g

21

<210> 69
<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<220>
 <221> misc_feature
 <222> 17
 <223> n = A,T,C or G

<220>
 <221> misc_feature
 <222> 17
 <223> n = A,T,C or G

<400> 69
 ctgccactgc tagttgngat aatcc 25

<210> 70
 <211> 25
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Primer

<400> 70
 gggcttctaa gcgacccaga tcttg 25

<210> 71
 <211> 27
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Primer

<400> 71
 gaatttcctt atggacaagc tctgtgc 27

<210> 72
 <211> 25
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Primer

<400> 72
 ggagcaggaa ctccaagacc tggag 25

<210> 73
 <211> 25
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Primer

<400> 73
 gctcaacctc atcacatact aaccc 25

<210> 74
 <211> 27
 <212> DNA

<213> Artificial Sequence

<220>

<223> Primer

<400> 74

gagatgggcg ggcaagtgcg gcaacag

27

<210> 75

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> Primer

<400> 75

gcctttgcaa tcaggatcca aatttggg

28

<210> 76

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> Primer

<400> 76

ctgctgcagt tcaggaaaca tcag

24

<210> 77

<211> 22

<212> DNA

<213> Artificial Sequence

<220>

<223> Primer

<400> 77

accggatgtg ctcacagaac tg

22

<210> 78

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Primer

<400> 78

tttgttatag gcatatcatt g

21

<210> 79

<211> 18

<212> DNA

<213> Artificial Sequence

<220>

<223> Primer

<400> 79

ttaaccagca aagtgtta 18

<210> 80
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Primer

<400> 80
 ttagggcaag agatggtaag g 21

<210> 81
 <211> 19
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Primer

<400> 81
 ttataacaat gatggaggg 19

<210> 82
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Primer

<400> 82
 cattaaaaag ggcacagacg c 21

<210> 83
 <211> 17
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Primer

<400> 83
 tggacattct ccgcagt 17

<210> 84
 <211> 907
 <212> DNA
 <213> human metapneumo virus

<400> 84
 atggaggtga aagtggagaa cattcgaaca atagatatgc tcaaagcaag agtaaaaaat 60
 cgtgtggcac gcagcaaatg ctttaaaaat gcctctttgg tcctcatagg aataactaca 120
 ttgagtattg ccctcaatat ctatctgatc ataaactata aaatgcaaaa aaacacatct 180
 gaatcagaac atcacaccag ctcacacccc atggaatcca gcagagaaac tccaacgggtc 240
 ccacagaca actcagacac caactcaagc ccacagcatc caactcaaca gtccacagaa 300
 ggctccacac tctactttgc agcctcagca agctcaccag agacagaacc aacatcaaca 360
 ccagatacaa caaacccgcc gcccttcgctc gacacacaca caacaccacc aagcgcaagc 420
 agaacaaaga caagtccggc agtccacaca aaaaacaacc caaggacaag ctctagaaca 480
 cattctccac cacgggcaac gacaaggacg gcacgcagaa ccaccactct ccgcacaagc 540


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agcacaagaa agagaccgtc cacagcatca gtccaacctg acatcagcgc aacaacccac 600
aaaaacgaag aagcaagtcc agcgagccca caaacatctg caagcacaac aagaatacaa 660
aggaaaagcg tggaggccaa cacatcaaca acatacaacc aaactagtta acaaaaaata 720
caaaaataact ctaagataaa ccatgcagac accaacaatg gagaagccaa aagacaattc 780
acaatctccc caaaaaggca acaacaccat attagctctg cccaaatctc cctggaaaaa 840
acactcgccc atataccaaa aataccacaa ccaccccaag aaaaaaactg ggcaaaaacaa 900
cacccaa 907

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<210> 85

<211> 908

<212> DNA

<213> human metapneumo virus

<400> 85

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atggaggtga aagtggagaa cattcgaaca atagatatgc tcaaagcaag tgtaaaaaat 60
cgtgtggcac gcagcaaagt ctttaaaaaat gcctcttttg tcctcatagg aataactaca 120
ttgagtattg ccctcaatat ctatctgac ataaactata aaatgcaaaa aaacacatct 180
gaatcagaac atcacaccag ctcatcacc atggaatcca gcagagaaac tccaacggtc 240
cccacagaca actcagacac caactcaagc ccacagcatc caactcaaca gtccacagaa 300
ggctccacac tctactttgc agcctcagca agctcaccag agacagaacc aacatcaaca 360
ccagatacaa caaacggccc gcccttcgtc gacacacaca caacaccacc aagcgcaagc 420
agaacaaaga caagtccggc agtccacaca aaaaacaacc caaggacaag ctctagaaca 480
cattctccac caggggcaac gacaaggacg gcacgcagga accaccactc tccgcacaag 540
cagcacaaga aagagaccgt ccacagcatc agtccaacct gacatcagcg caacaacca 600
caaaaacgaa gaagcaagtc cagcgagccc acaaacatct gcaagcaca caagaatata 660
aaggaaaagc gtggaggcca acacatcaac aacatacaac caaactagtt aacaaaaaat 720
acaaaataac tctaagataa accatgcaga caccaacaat ggagaagcca aaagacaatt 780
cacaatctcc ccaaaaaggc aacaacacca tattagctct gcccaaactc ccttgaaaaa 840
aacactcgcc catataccaa aaataccaca accaccccaa gaaaaaaact gggcaaaaaca 900
acacccaa 908

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<210> 86

<211> 907

<212> DNA

<213> human metapneumo virus

<400> 86

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atggaggtga aagtggagaa cattcgaaca atagatatgc tcaaagcaag agtaaaaaat 60
cgtgtggcac gcagcaaagt ctttaaaaaat gcctcttttg tcctcatagg aataactaca 120
ctgagtattg ccctcaatat ctatctgac ataaactata aaatgcaaaa aaacacatct 180
gaatcagaac atcacaccag ctcatcacc atggaatcca gcagagaaac tccaacggtc 240
cccacagata attcagacac caactcaagc ccacaacatc caactcaaca gtccacagaa 300
ggctccacac tctactttgc agcctcagca aactcaccag agacagaacc aacatcaaca 360
ccagacacaa caaacggccc gcccttcgtc gacacacaca caacaccacc aagcgcaagc 420
agaacaaaga caagtccggc agtccacaca aaaaacaacc caaggataag ctccagaaca 480
cactctccac catgggcaac gacaaggacg gcacgcagaa ccaccactct ccgcacaagc 540
agcacaagaa agagaccgtc cacagcatca gcccaaccg acatcagcgc aacaacccac 600
aaaaacgaag aagcaagtcc agcgagccca caaacatctg caagcacaac aagaacacaa 660
aggaaaagcg tggaggccaa cacatcaaca acatacaacc aaactagtta acaaaaaata 720
caaaaataact ctaagataaa ccatgcagac accaacaatg gagaagtcaa aagacaattc 780
acaatctccc caaaaaggca acaacaccat attagctctg cccaaatctc cctggaaaaa 840
acactcgccc atataccaaa aataccacaa ccaccccaag aaaaaaactg ggcaaaaacaa 900
cacccaa 907

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<210> 87

<211> 907

<212> DNA

<213> human metapneumo virus

<400> 87

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atggaggtga aagtggagaa cattcgaaca atagatatgc tcaaagcaag agtaaaaaat 60

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cgtgtggcac gcagcaaagt ctttaaaaaat gcctcttttg tctcatagg aataactaca 120
ttgagtattg ccctcaatat ctatctgata ataaactata aaatgcaaaa aaacacatct 180
gaatcagaac atcacaccag ctcatcacc atggaatcca gcagagaaac tccaacggtc 240
cccacagata attcagacac caactcaagc ccacaacatc caactcaaca gtccacagaa 300
ggctccacac tctactttgc agcctcagca aactcaccag agacagaacc aacatcaaca 360
ccagacacaa cagaccgccc gcccttcgtc gacacacaca caacaccacc aagcgcaagc 420
agaacaaaga caagtccggc agtccacaca aaaaacaacc caaggataag ctccagaaca 480
cattctccac catgggcaac gacaaggacg gcacgcagaa ccaccactct cgcacaagc 540
agcacaagaa agagaccgtc cacagcatca gtccaacccg acatcagcgc aacaaccac 600
aaaaacgaag aagcaagtcc agcgagccca caaacatctg caagcacaac aagaacacaa 660
aggaaaagcg tggaggccaa cacatcaaca acatacaacc aaactagtta acaaaaaata 720
caaaataact ctaagataaa ccatgcagac accaacaatg gagaagtcaa aagacaattc 780
acaatctccc caaaaaggca acaacaccat attagctctg cccaaatctc cctggaaaaa 840
acactcgccc atataccaaa aataccacaa ccacccaag aaaaaaactg ggcaaaacaa 900
cacccaa 907

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<210> 88

<211> 907

<212> DNA

<213> human metapneumo virus

<400> 88

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atggaggtga aagtggagaa cattcgaaca atagatatgc tcaaagcaag agtaaaaaat 60
cgtgtggcac gcagcaaagt ctttaaaaaat gcctcttttg tctcatagg aataactaca 120
ttgagtattg ccctcaatat ctatctgata ataaactata aaatgcaaaa aaacacatct 180
gaatcagaac atcacaccag ctcatcacc atggaatcca gcagagaaac tccaacggtc 240
cccacagata attcagacac caactcaagc ccacaacatc caactcaaca gtccacagaa 300
ggctccacac tctactttgc agcctcagca agctcaccag agacagaacc aacatcaaca 360
ccagacacaa cagaccgccc gcccttcgtc gacacacaca caacaccacc aagcgcaagc 420
agaacaaaga caagtccggc agtccacaca aaaaacaacc caaggataag ctccagaaca 480
cattctccac catgggcaac gacaaggacg gcacgcagaa ccaccactct cgcacaagc 540
agcacaagaa agagaccgtc cacagcatca gtccaacccg acatcagcgc aacaaccac 600
aaaaacgaag aagcaagtcc agcgagccca caaacatctg caagcacaac aagaacacaa 660
aggaaaagcg tggaggccaa cacatcaaca acatacaacc aaactagtta acaaaaaata 720
caaaataact ctaagataaa ccatgcagac accaacaatg gagaagtcaa aagacaattc 780
acaatctccc caaaaaggca acaacaccat attagctctg cccaaatctc cctggaaaaa 840
acactcgccc atataccaaa aataccacaa ccacccaag aaaaaaactg ggcaaaacaa 900
cacccaa 907

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<210> 89

<211> 907

<212> DNA

<213> human metapneumo virus

<400> 89

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atggaggtga aagtggagaa cattcgaaca atagatatgc tcaaagcaag agtgaaaaat 60
cgtgtggcac gcagcaaagt ctttaaaaaat gcctcttttg tcctaataagg aataactaca 120
ttgagtattg ccctcaatat ctatctgata ataaactata caatgcaaga aaacacatcc 180
gaatcagaac atcacaccag ctcatcacc atggaatcca gcagggaaac tccaacggtc 240
cccatagaca actcagacac caatccaggc tcacagtatc caactcaaca gtccacagaa 300
gactccacac tccactctgc agcttcagca agctcaccag agacagaacc aacatcaaca 360
ccagacacaa caagccgccc gcccttcgtc gacacacaca caacaccacc aagtgcgaagc 420
aggacaagga caagtccggc agtccacaca aaaaacaatc caagggtaag cccacagaaca 480
cattccccac catgggcaat gacaaggacg gtccgcggaa ccaccactct cgcacaagc 540
agcacaagaa aaagactgtc tacagcatca gtccaacccg acagcagcgc aacaaccac 600
aaacacgaag aaacaagccc agtgagccca caaacatctg caagcacagc aagaccacaa 660
aggaagggca tggaggccaa cacatcaaca acatacaacc aaactagtta acaaaaaata 720
caaaataact ctaagataaa ccatgtagac accaacaatt gagaagccaa aaggcaattc 780
acaatctccc aaaaaagcaa caacaccata ttagctccgc ttaaattctc ctgaaaaaaa 840
cactcaccca tataccaact ataccacaa catcccaaga aaaaaggctg ggcaaaacaa 900
cacccaa 907

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<210> 90
 <211> 908
 <212> DNA
 <213> human metapneumo virus

<400> 90
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 cgtgtggcac gcagcaaatg ctttaaaaat gcctctttga tcctaataagg aataactaca 120
 ttgagtatag ccctcaatat ctatctgatc ataaactata caatgcaaga aaacacatcc 180
 gaatcagaac atcacaccag ttcacacccc atggaatcca gcagggaaac tccaacggtc 240
 cctatggaca actcagacac caatccaggc tcacagtatc caactcaaca gtccacagaa 300
 ggctccacac tccactttgc agcctcagca agctcaccag agacagaacc aacatcaaca 360
 ccagacacaa caagccgccc gcccttcgtc gacacacaca caacaccatc aagtgcaagc 420
 agaacaaaga caagtccggc agtccacaca aaaaacaatc taaggataag cccagaaca 480
 cattccccac catgggcaat gacaaggacg gtccgtggaa ccaccactct ccgcacaagc 540
 agcataagaa aaagaccgtc cacagcatca gtccaacctg acagcagcgc aacaaccac 600
 aaacacgaag aagcaagccc agtgagcccg caagcatctg caagcacagc aagaccacaa 660
 aggaagggca tggaggccag cacatcaaca acatacaacc aaactagtta aaaaaaata 720
 taaaataact ctaagataaa ccatgtagac accaacaatt gagaagccaa aaggcaattc 780
 acaatctccc caaaaaggca acaacaccat attagctccg cttaaatctc cctggaaaaa 840
 acactcgccc atataccaac tataccacaa ccatcccaag gaaaaaagct gggtaaaaaa 900
 acacccaa 908

<210> 91
 <211> 908
 <212> DNA
 <213> human metapneumo virus

<400> 91
 atggaggtga aagtggagaa cattcgaaca atagatatgc tcaaagcaag agtgaaaaat 60
 cgtgtggcac gcagcaaatg ctttaaaaat gcctctttga tcctaataagg aataactaca 120
 ttgagtatag ccctcaatat ctatctgatc ataaactata caatgcaaga aaacacatcc 180
 gaatcagaac atcacaccag ctcatcacc ctcacagtatc caactcaaca gtccacagaa 300
 cctatggaca actcagacac caatccaggc agcctcagca agctcaccag agacagaacc aacatcaaca 360
 ggctccacac tccactttgc agcctcagca gacacacaca caacaccatc aagtgcaagc 420
 ccagacacaa caagccgccc gcccttcgtc gacacacaca caacaccatc aagtgcaagc 420
 agaataagga caagtccggc agtccacaca aaaaacaatc taaggataag cccagaaca 480
 cattccccac catgggcaat gacaaggacg gtccgtggaa ccaccactct ccgcacaagc 540
 agcataagaa aaagaccgtc cacagcatca gtccaacctg acagcagcgc aacaaccac 600
 aaacacgaag aagcaagccc agtgagcccg caagcatctg caagcacagc aagaccacaa 660
 aggaagggca tggaggccag cacatcaaca acatacaacc aaactagtta aaaaaaata 720
 tacaataact ctaagataaa ccatgtagac accaacaatt gagaagccaa aaggcaattc 780
 acaatctccc caaaaaggca acaacaccat attagctccg cttaagtctc cctggaaaaa 840
 acactcgccc atataccaac tataccacaa ccatccaaag aaaaaaagct gggcaaaaaa 900
 acacccaa 908

<210> 92
 <211> 888
 <212> DNA
 <213> human metapneumo virus

<400> 92
 atggaggtga aagtagagaa cattcgagca atagacatgc tcaaagcaag agtgaaaaat 60
 cgtgtggcac gtagcaaatg ctttaaaaat gcttctttta tcctcatagg aataactaca 120
 ctgagtatag ctctcaatat ctatctgatc ataaactata caatacaaaa aaccacatcc 180
 gaatcagaac accacaccag ctaccacccc acagaaccca acaaggaagc ttcaacaatc 240
 tccacagaca acccagacat caatccaagc tcacagcatc caactcaaca gtccacagaa 300
 aacccacac tcaaccccgc agcatcagcg agcccatcag aaacagaacc agcatcaaca 360
 ccagacacaa caaacgcgct gtccctcgta gcaggtcca cagcacaacc aagtgaagc 420
 agaacaaaga caaaaccgac agtccacaca atcaacaacc caaacacagc ttccagtaca 480

| | | | | | | |
|------------|-------------|-------------|-------------|------------|------------|-----|
| caatccccac | cacggacaac | aacgaaggca | atccgcagag | ccaccacttt | ccgcatgagc | 540 |
| agcacaggaa | aaagaccaac | cacaacatta | gtccagtccg | acagcagcac | cacaacccaa | 600 |
| aatcatgaag | aaacagggttc | agcgaaccca | caggcgctctg | caagcacaat | gcaaaactag | 660 |
| cacaccaata | atataaaacc | aaattagtta | acaaaaaatg | cgagatagct | ctaaagcaaa | 720 |
| acatgtaggt | accaacaatc | aagaaaccaa | aagacaactc | acaatctccc | taaaacagca | 780 |
| acgacaccat | gtcagctttg | ctcaaattctc | tctgggagaa | acttctaccc | acatactaac | 840 |
| aacatcacia | ccatctcaag | aaaagaaact | gggcaaaaca | gcattcaa | | 888 |

<210> 93

<211> 888

<212> DNA

<213> human metapneumo virus

<400> 93

| | | | | | | |
|-------------|------------|-------------|------------|------------|------------|-----|
| atggaggtga | aagtagagaa | cattcgagca | atagacatgc | tcaaagcaag | agtgaaaaat | 60 |
| cgtgtggcac | gcagcaaatg | ctttaaaaat | gcttctttaa | tcctcatagg | aataactaca | 120 |
| ctgagtatag | ccctcaatat | ctatctgac | ataaactaca | caatacaaaa | aaccacatct | 180 |
| gaatcagaac | accacactag | ctcaccaccc | acagaatcca | acaaagaaac | ttcaacaatc | 240 |
| cccatagaca | accagacat | caatccaaac | tcacagcatc | caacccaaca | gtccacagaa | 300 |
| agccccacac | tcaacccgcg | agcctcgggtg | agcccatcag | aaacagaacc | agcatcaaca | 360 |
| ccagacacaa | caaaccgcct | gtcctccgta | gacagatcca | caacacaacc | aagtgaaagc | 420 |
| agaacaaaaga | caaaaccaac | agtccacaca | aaaaacaatc | caagtacagt | ttccagaaca | 480 |
| caatccccac | tacgggcaac | aacgaaggcg | gtcctcagag | ccaccgcttt | ccgcacgagc | 540 |
| agcacaagaa | aaagaccaac | cacaacatca | gtccagtctg | acagcagcac | cacaacccaa | 600 |
| aatcatgaag | aaacaagttc | agcgaaccca | caggcatctg | caagcacaat | gcaaagccag | 660 |
| cacaccaaca | acataaaacc | aaattagtta | acaaaaaata | cgagatagct | ctaaagtaaa | 720 |
| acatgtaggt | accaacaatc | aaggaatcaa | aagacaactc | acaatctccc | taaaacagca | 780 |
| acaacatcat | gtcagttttg | ctcaaattctc | cctgggagaa | actttcgccc | acatactaac | 840 |
| aacatcacia | ccatctcaag | aaaagaaact | gggcaaaaca | gcacccaa | | 888 |

<210> 94

<211> 888

<212> DNA

<213> human metapneumo virus

<400> 94

| | | | | | | |
|-------------|------------|-------------|------------|------------|-------------|-----|
| atggaggtga | aagtagagaa | catccgagca | gtagacatgc | tcaaagcaag | agtcaaaaaat | 60 |
| cgtgtggcac | gcagcaaatg | ctttaaaaat | gcctccttaa | tcctcgtagg | aataactaca | 120 |
| ctgagcatag | ccctcaatat | ctatctgac | gtaaactaca | caatacaaaa | aaccacatcc | 180 |
| gaatcagaac | accacaccag | ctcatcacc | acagaatcca | acaaaggaac | ttcaacaatc | 240 |
| cccacagaca | accagacat | caatccaaat | tcacaacatc | caactcaaca | gtccacagaa | 300 |
| agccccacac | tcaacaccgc | agcctcgggtg | agcccatcag | aaacagaacc | agcatcaaca | 360 |
| ccagacacaa | caaaccgcct | gtcctccgca | gacagatcca | caacacaacc | aagtgaaagc | 420 |
| agaacaaaaga | caaagctgac | agtccacaca | aaaaacaacc | taagtacagc | ctccagaaca | 480 |
| caatcaccac | cacgggcaac | aacgaaggcg | gtcctcagag | acaccgcctt | ccacacgagc | 540 |
| agcacaggaa | aaagaccaac | cacaacatca | gtccagtctg | gcagcagcac | cacaactcaa | 600 |
| aatcatgaag | aaacaagttc | atcgaaccca | caggcatctg | caagcacaat | gcaagaccag | 660 |
| gacaccaaca | atacaaaaca | aaattagtta | acaaaaaata | caagatagct | ctaaagtaaa | 720 |
| acatgtaggt | accaacagta | aagaaatcaa | aagacaactc | acaatctccc | caaaacagca | 780 |
| acaacatcat | gtcagcttcg | ctcaaattctc | cctgggagaa | actctcgccc | acatactaac | 840 |
| aacatcacia | ctatctcaag | aaaagaaact | gggcaaaaaa | acactcaa | | 888 |

<210> 95

<211> 887

<212> DNA

<213> human metapneumo virus

<400> 95

| | | | | | | |
|------------|------------|------------|------------|------------|------------|-----|
| atggaggtga | aagtagagaa | catccgagca | gtagacatgc | tcaaagcaag | agttaaaaat | 60 |
| cgtgtggcac | gcagcaaatg | ctttaaaaat | gcctccttaa | tcctcgtagg | aataactaca | 120 |
| ctgagtatag | ccctcaatat | ctatctgac | gtaaactaca | caatacaaaa | aaccacatcc | 180 |

| | | | | | | |
|------------|------------|-------------|-------------|------------|-------------|-----|
| gaatcagaac | accacactag | ctcatcaccc | acagaatcca | acaaaggaac | ttcaacaatc | 240 |
| ccacagacaa | cccagacatc | aatccaaatt | cacaacatcc | aactcaacag | tccacagaaa | 300 |
| gccccacact | caacaccgca | gcctcgggtga | gcccatcaga | aacagaacca | gcacacacac | 360 |
| cagacacaa | aaaccgcctg | tcctccgcag | acagatccac | aacacaacca | agtgaagca | 420 |
| gaacaaagac | aaagctgaca | gtccacacaa | aaaacaacct | aagtacagcc | tccagaacac | 480 |
| aatcaccacc | acgggcaaca | acgaaggcgg | tcctcagaga | caccgccttc | cacacgagca | 540 |
| gcacaggaaa | aagaccaacc | acaacatcag | tccagtctgg | cagcagcacc | acaactcaaa | 600 |
| atcatgaaga | aacaagtcca | tcgaacccac | aggcatctgc | aagcacaatg | caagaccagg | 660 |
| acaccaacaa | tacaaaaaaa | aattagttaa | caaaaaatac | aagatagctc | taaaagtaaaa | 720 |
| catgtaggta | ccaacagtaa | agaaatcaaa | agacaactca | taatctcccc | aaaacagcaa | 780 |
| caacatcatg | tcagcttcgc | tcaaatctcc | ctggggagaaa | ctctcgccca | cataactaaca | 840 |
| acatcacaa | tatctcaaga | aaagaaaactg | ggcaaaaaaa | cactcaa | | 887 |

<210> 96

<211> 888

<212> DNA

<213> human metapneumo virus

<400> 96

| | | | | | | |
|-------------|-------------|-------------|-------------|------------|-------------|-----|
| atggagggtga | aagtagagaa | cattcgagca | atagacatgc | tcaaagcaag | aatgaaaaaat | 60 |
| cgtgtggcac | gcagcaaattg | ctttaaaaaat | gcttcttttaa | tcctcatagg | aataactact | 120 |
| ctgagtatag | ccctcaatat | ctatctgatc | ataaactaca | caatacaaaa | aaccacatct | 180 |
| gaatcagaac | accacactag | ctcaccaccc | acagaatcca | acaaagaaac | ttcaacaatc | 240 |
| cctatagaca | accagacat | caatccaaac | tcacagcatc | caactcaaca | gtccacagaa | 300 |
| agcctcacac | tcaaccccg | agcctcgggtg | agcccatcag | aaacagaacc | agcatcaaca | 360 |
| ccagacacaa | caaaccgcct | gtcctccgta | gacagatcca | caacacaacc | aagtgaagc | 420 |
| agaacaaaga | caaaactgac | agtccacaaa | aaaaacatcc | caagtacagt | ctctagaaca | 480 |
| caatcctcaa | tacgggcaac | aacgaaggcg | gtcctcagag | ccaccgcctt | tcgcacgagc | 540 |
| agcacaggag | aaagaccaac | tacaacatca | gtccagtctg | acagcagcac | cacaacccaa | 600 |
| aatcatgaag | aaacagggttc | agcgaaccca | caggcatctg | caagcacaat | gcaaaactag | 660 |
| cacaccaaca | ttgtaaaacc | aaattagtta | acaaaaaata | tgaaatagct | ctaaagttaa | 720 |
| acatgtaggt | gctaacaatc | aagaaatcaa | aagacatctc | ataatctctc | caaaacagca | 780 |
| acaacatcat | gtcaactttg | ctcaaatctc | cctggggagaa | actttcgccc | ccatactgac | 840 |
| aacatcacaa | tcattctcaag | aaaagaaaact | gggcaaaaaca | gcacccaaa | | 888 |

<210> 97

<211> 888

<212> DNA

<213> human metapneumo virus

<400> 97

| | | | | | | |
|-------------|-------------|-------------|-------------|------------|-------------|-----|
| atggagggtga | aagtagagaa | cattcgagca | atagacatgc | tcaaagcaag | agtgaaaaaat | 60 |
| cgtgtggcac | gcagcaaattg | ctttaaaaaat | gcttcttttaa | tcctcatagg | aataactact | 120 |
| ctgagtatag | ccctcaacat | ctatctgatc | ataaactaca | caatacaaaa | aaccacatct | 180 |
| gaatcagaac | accacactag | ctcaccaccc | acagaatcta | acaaagaaac | ttcaacaatc | 240 |
| tctatagaca | accagacat | caatccaaac | tcacagcatc | caactcaaca | gtccacagaa | 300 |
| agcctcacac | tcagccccc | agcctcgggtg | agcccatcag | aaacagaacc | agcatcaaca | 360 |
| tcagacacaa | caagccgcct | gtcctccgta | gacagatcca | caacacaacc | aagtgaagc | 420 |
| agagcaagga | caaaaccgac | agtccacaag | aaaaacatcc | caagtacagt | ttctagaaca | 480 |
| caatccccac | tacgggcaac | aacgaaggcg | gtcctcagag | ccaccgcctt | tcgcacgagc | 540 |
| agcacaggag | agggaaccaac | cacaacatcg | gtccagtctg | acagcagcac | cacaacccaa | 600 |
| aatcatgaag | aaacagggttc | agcgaaccca | caggcatctg | caagcacaat | gcaaaactag | 660 |
| cacaccaaca | ttgtaaaacc | aaattagtta | acaaaaaata | tgaaatagtt | ctaaagttaa | 720 |
| acatgtaggt | gctaacaatc | aagaaatcaa | aagacaactc | ataatctctc | taaaacagca | 780 |
| acaacatcat | gtcaactttg | ctcaaatctc | cctggggagaa | actttcgccc | ccatactgac | 840 |
| aacatcacaa | tcattctcaag | aaaagaaaact | gggcaaaaaca | gcacccaaa | | 888 |

<210> 98

<211> 888

<212> DNA

<213> human metapneumo virus

<400> 98

```
atggaggtga aagtagagaa cattcgagca atagacatgc tcaaagcaag agtgaaaaat 60
cgtgtggcac gtagcaaatg ctttaaaaat gcttctttaa tcctcatagg aataactaca 120
ctgagtatag ctctcaatat ctatctgac ataaactaca caatacaaaa aaccacatct 180
gaatcagaac accacaccag ctcaccaccc acagaatcca acaaggaagc ttcaacaatc 240
tccacagaca atccagacat caatccaaac tcacagcatc caactcaaca gtccacagaa 300
aaccacacac taaacccgcg agcatcgggtg agctcatcag aaacagaacc agcatcaaca 360
ccagacacaa caaacgcgct gtctctcgta gacaggtcca cagcacaacc aagtgaagc 420
agaacaaaga caaaaccgac agtccacaca agaaacaacc caagcacagc ttccagcaca 480
caatccccac cacgggtaac aacgaaggca atcctcagag ccaccgtctt ccgcatgagc 540
agcacaggaa aaagaccagc cacaacatta gtccagtccg acagcagcac cacaacccaa 600
aatcatgaag aaacagggtc agcaaactca caggcatctg caagcacaat gcaaaactag 660
cactccaaga atataaaaac aaattagtta acaaaaaata cgagatagct ctaaaagtaa 720
acatgtaggc accaacaatc aggaaattaa aagacaactc acaacctccc taaaacagca 780
acgacaccat gtcaactttg ctcaaattct tctgggagaa acttttgccc acatactaac 840
aacatcacia tcattctcaag aaaagaaact gggcaaaaca gcatccaa 888
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<210> 99

<211> 888

<212> DNA

<213> human metapneumo virus

<400> 99

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atggaggtga aagtagagaa cattcgagca atagacatgc tcaaagcaag agtgaaaaat 60
cgtgtggcac gcagcaaatg ctttaaaaat gcttctttaa tcctcatagg aataactact 120
ctgagtatag ccctcaacat ctatctgac ataaactaca caatacaaaa aaccacatct 180
gaatcagaac accacactag ctcaccaccc acagaatcta acaaagaaac ttcaacaatc 240
tctatagaca actcagacat caatccaaac tcacagcatc caactcaaca gtccacagaa 300
agcctcacac tcagccccac agcctcgggtg agcccatcag aaacagaacc agcatcaaca 360
tcagacacaa caaacgcgct gtcttccgta gacagatcca caacacaacc aagtgaagc 420
agagcaagaa caaaaccgac agtccacaag aaaaacatcc caagtacagt ttctagaaca 480
caatccccac tacgggcaac aacgaaggcg gtccctcagag ccaccgcctt tcgcatgagc 540
agcacaggag agggaccaac cacaacatcg gtccagtctg acagcagcac cacaacccaa 600
aatcatgaag aaacagggtc agcgaaccca caggcatctg caagcacaat gcaaaaccag 660
cacaccaaca ttgcaaaacc aaattagtta acaaaaaata tgaaatagtt ctaaaagtaa 720
acatgtaggc gccaacaatc aagaaatcaa aagacaactc acaatctccc taaaacagca 780
acaacatcat gccaaactttg ctcaaattct cctgggagaa accctcgccc ccatactgac 840
aacatcacia tcattctcaag aaaagaaact gggcaaaaca gcacccaa 888
```

<210> 100

<211> 888

<212> DNA

<213> human metapneumo virus

<400> 100

```
atggaggtga aagtagagaa cattcgagca atagacatgc tcaaagcaag agtgaaaaat 60
cgtgtggcac gcagcaaatg ctttaaaaat gcttctttaa tcctcatagg aataactact 120
ctgagtatag ccctcaatat ctatctgac ataaactaca caatacaaaa aaccacatct 180
gaatcagaac accacactag ctcaccaccc acagaatcta acaaggaac ttcaacaatc 240
cctatagaca acccagacat caatccaaac tcacagcatc caactcaaca gtccacagaa 300
agcctcacac tctacccac atcctcgggtg agctcatcag aaacagaacc agcatcaaca 360
ccaggcataa caaacacact gtcttttgta gacagatcca caacacaacc aagtgaagc 420
agaacaaaga caaacgggac agtccacaaa aaaaacatct caagtacagt ttctagaaca 480
cagtccccac cacggacaac agcgaaggcg gtccccagag ccaccgcctt tcgcacgagc 540
agcacaggag aaagaccaac cacaacacca gtccagcccg atagcagcac cacaacacaa 600
aatcatgaag aaacagggtc agcgaaccca caggcatccg caagcacaat gcaaaaccag 660
cacaccaaca ttgcaagacc aaattagtta acaaaaaata tgaaatagct ctaaaagtaa 720
acatgtaggc gccaacaatc aagaaatcaa aagataactc ataattctct taaaacagca 780
acaacatcat gttaaactttg ctcaaattct tctgggagaa accttcgccc ccatactggc 840
aacatcacia tcattctcaag aaaagaaact gggcaaaaca acacccaa 888
```

<210> 101
 <211> 888
 <212> DNA
 <213> human metapneumo virus

<400> 101
 atggaggtga aagtagagaa cattcgagca atagacatgc tcaaagcaag agtgaaaaat 60
 cgtgtggcac gcagcaaattg ctttaaaaaat gcttcttttaa tcctcatagg aataactact 120
 ctgagtatag ccctcaatat ctatctgatc ataaactaca caatacaaaa aaccacatct 180
 gaatcagaac accacactag ctcaccaccc acagaatcta acaaggaaac ttcaacaatc 240
 cctatagaca acccagacat caatccaaac tcacagcatc caactcaaca gtccgcagaa 300
 agcctcacac tctaccccac atcctcgggtg agctcatcag aaacagaacc agcatcaaca 360
 ccaggcataa caaaccacct gtcctttgtg gacagatcca caacacaacc aagtgaagc 420
 agaacaaaga caaaccggac agtccacaaa aaaaacatct caagtacagt ttctagaaca 480
 cagtccccac cagggacaac agcgaaggcg gtccccagag ccaccgcctt tcgcacgagc 540
 agcacaggag aaagaccaac cacaacacca gtccagcccg atagcagcac cacaacacaa 600
 aatcatgaag aaacaggctc agcgaaccca caggcatccg caagcacaat gcaaaaccag 660
 cacaccaaca ttgcaagacc aaattagtta acaaaaaata tgaaatagct ctaaagtaaa 720
 acatgtaggt gccacaatc aagaaatcaa aagataactc ataattcttc taaaacatca 780
 acaacatcat gttaactttg ctcaaattctc tctggggagaa accttcgccc ccatactggc 840
 aacatcacaa tcattctcaag aaaagaaact gggcaaaaaca acacccaa 888

<210> 102
 <211> 888
 <212> DNA
 <213> human metapneumo virus

<400> 102
 atggaggtga aagtagagaa tattcgagca atagacatgc tcaaagcaag agtgaaaaat 60
 cgtgtggcac gcagcaaattg ctttaaaaaat gcttcttttaa tcctcatagg aataactact 120
 ctgagtatag ccctcaatat ctatctgatc ataaactaca caatacaaaa aaccacatct 180
 gaatcagaac accacactag ctcaccaccc acagaatcta acaaggaaac ttcaacaatc 240
 cctatagaca acccagacat caatccaaac tcacagcatc caactcaaca gtccacagaa 300
 agcctcacac tctaccccac atcctcgggtg agctcatcag aaacagaacc agcatcaaca 360
 ccaggcataa caaaccacct gtcctttgtg gacagatcca caacacaacc aagtgaagc 420
 agaacaaaga caaaccggac agtccacaaa aaaaacatct caagtacagt ttctagaaca 480
 cagtccccac cagggacaac agcgaaggcg gtccccagag ccaccgcctt tcgcacgagc 540
 agcacaggag aaagaccaac cacaacacca gtccagcccg atagcagcac cacaacacaa 600
 aatcatgaag aaacaggctc agcgaaccca caggcatccg caagcacaat gcaaaaccag 660
 cacaccaaca ttgcaagacc aaattagtta acaaaaaata tgaaatagct ctaaagtaaa 720
 acatgtaggt gccacaatc aagaaatcaa aagataactc ataattcttc taaaacatca 780
 acaacatcat gttaactttg ctcaaattctc tctggggagaa accttcgccc ccatactggc 840
 aacatcacaa tcattctcaag aaaagaaact gggcaaaaaca acacccaa 888

<210> 103
 <211> 888
 <212> DNA
 <213> human metapneumo virus

<400> 103
 atggaggtga aagtagagaa cattcgagca atagacatgc tcaaagcaag agtgaaaaat 60
 cgtgtggcac gtagcaaattg ctttaaaaaat gcttcttttaa tcctcatagg aataactaca 120
 ctgagcatag ccctcaatat ctatctgatc ataaactaca caatacaaaa aaccacatct 180
 gaatcagaac accacaccag ctcaccaccc acagaatcca acaagggaagc ttcaacaatc 240
 tccacagaca acccagacat caatccaaac tcacagcatc caactcaaca gtccacagaa 300
 aaccccacac tcaacccagc agcatcagcg agcccatcag aaacagaatc agcatcaaca 360
 ccagatacaa caaaccgcct gtcctccgta gacaggtcca cgggtacaacc aagtgaagc 420
 agaacaaaga caaaactgac agtccacaca agaaacaacc taagcacagc ctccagtaca 480
 caatccccac caggggcaac aacgaaggca atccgcagag ccaccaccct ccgcatgagc 540
 agcacaggaa gaagaccaac cacaacacta gtccagtcag acagcagcac cacaacccaa 600

| | | | | | | |
|------------|-------------|-------------|------------|------------|------------|-----|
| aatcatgaag | aaacaggctc | agcgaaccca | caggcatctg | caagcacaat | gcaaaaccag | 660 |
| cacaccaaca | atataaaaacc | aaattagtta | acaaaaaata | cgagatagct | ctaaagtaaa | 720 |
| acatgtaggc | accaacaatc | aagaaaccaa | aagataactc | acaatcccc | caaaacagca | 780 |
| acgacaccat | gtcagctttg | ctcaaattctc | tctgggagaa | acttttgccc | acatactaac | 840 |
| aacatcacaa | ccatctcaag | aaaagaaact | gggcaaaaca | gcatccaa | | 888 |

<210> 104

<211> 888

<212> DNA

<213> human metapneumo virus

<400> 104

| | | | | | | |
|-------------|-------------|-------------|-------------|------------|------------|-----|
| atggagggtga | aagtagagaa | cattcgagca | atagacatgc | tcaaagcaag | agtgaaaaat | 60 |
| cgtgtggcac | gtagcaaatg | ctttaaaaat | gcttctttaa | tcctcatagg | aataactaca | 120 |
| ctgagcatag | ccctcaatat | ctatctgatc | ataaactaca | caatacaaaa | aaccacatct | 180 |
| gaatcagaac | accacaccag | ctcaccaccc | acagaatcca | acaaggaagc | ttcaacaatc | 240 |
| tccacagaca | acccagacat | caatccaaac | tcacagcatc | caactcaaca | gtccacagaa | 300 |
| aacccccacac | tcaacccagc | agcatcagcg | agcccatcag | aaacagaatc | agcatcaaca | 360 |
| ccagatacaa | caaaccgcct | gtcctcgcga | gacagggtcca | cggtacaacc | aagtgaaaac | 420 |
| agaacaaaga | caaaactgac | agtccacaca | agaaacaacc | taagcacagc | ctccagtaca | 480 |
| caatccccac | cacgggcaac | aacgaaggca | atccgcagag | ccaccaccct | ccgcatgagc | 540 |
| agcacaggaa | gaagaccaac | cacaacacta | gtccagtcg | acagcagcac | cacaacccaa | 600 |
| aatcatgaag | aaacaggctc | agcgaaccca | caggcatctg | caagcacaat | gcaaaaccag | 660 |
| cacaccaaca | atataaaaacc | aaattagtta | acaaaaaata | cgagatagct | ctaaagtaaa | 720 |
| acatgtaggc | accaacaatc | aagaaaccaa | aagataactc | acaatcccc | caaaacagca | 780 |
| acgacaccat | gtcagctttg | ctcaaattctc | tctgggagaa | acttttgccc | acatactaac | 840 |
| aacatcacaa | ccatctcaag | aaaagaaact | gggcaaaaca | gcatccaa | | 888 |

<210> 105

<211> 901

<212> DNA

<213> human metapneumo virus

<400> 105

| | | | | | | |
|------------|-------------|-------------|------------|-------------|-------------|-----|
| atggaagtaa | gagtggagaa | cattcgagcg | atagacatgt | tcaaagcaaa | gataaaaaaac | 60 |
| cgtataagaa | gcagcagggtg | ctatagaaat | gctacactga | tccttatttg | actaacagcg | 120 |
| ttaagcatgg | cacttaatat | tttcctgatc | atcgatcatg | caacattaag | aaacatgatc | 180 |
| aaaacagaaa | actgtgctaa | catgccgtcg | gcagaaccaa | gcaaaaagac | cccaatgacc | 240 |
| tccacagcac | gccc aaacac | caaacc caat | ccacagcaag | caacacagtg | gaccacagag | 300 |
| aactcaacat | ccccagtagc | aacccacagag | ggccatccat | acacaggggac | aactcaaaaca | 360 |
| tcagacacaa | cagctcccca | gcaaaccaca | gacaaacaca | cagcaccgct | aaaatcaacc | 420 |
| aatgaacaga | tcaccacagac | aaccacagag | aaaaagacaa | tcagagcaac | aacccaaaaa | 480 |
| agggaaaaag | gaaaagaaaa | cacaaaccaa | accacaagca | cagctgcaac | ccaaacaacc | 540 |
| aacaccacca | accaaatacag | aaatgcaagt | gagacaatca | caacatccga | cagacccaga | 600 |
| actgacacca | caacccaaag | cagcgaacag | acaacccggg | caacagaccc | aagctccccc | 660 |
| ccacaccatg | catagagagg | tgcaaaactc | aaatgagcac | aacacacaaa | catcccatcc | 720 |
| aagtagttaa | caaaaaacca | caaaataacc | ttgaaaacca | aaaaacccaa | acataaaccc | 780 |
| agacccagaa | aaacatagac | accatattgga | aggttctagc | atatgcacca | atgagatggc | 840 |
| atctgttcat | gtatcaatag | caccaccatc | attcaaggaa | taagaagagg | cgaaaattta | 900 |
| a | | | | | | 901 |

<210> 106

<211> 901

<212> DNA

<213> human metapneumo virus

<400> 106

| | | | | | | |
|------------|-------------|------------|------------|------------|------------|-----|
| atggaagtaa | gagtggagaa | cattcgagcg | atagacatgt | tcaaagcaaa | gataaagaac | 60 |
| cgtataagaa | gcagcagggtg | ctatagaaat | gctacactga | tccttatttg | actaacagcg | 120 |
| ttaagcatgg | cacttaatat | tttcctgatc | attgatcatg | caacattaag | aaacatgatc | 180 |
| aaaacagaaa | actgtgctaa | catgccatcg | gcagaaccaa | gcaaaaagac | cccaatgacc | 240 |

| | | | | | | |
|------------|------------|------------|------------|------------|-------------|-----|
| tccacagcag | gcccagcac | cgaacccaat | ccacagcaag | caacacaatg | gaccacagag | 300 |
| aactcaacat | ccccagcagc | aaccctagag | agccatccat | acacagggac | aacccaaaca | 360 |
| ccagacataa | cagctcccca | acaaaccaca | gacaaacaca | cagcactgcc | aaaatcaacc | 420 |
| aatgaacaga | tcacccagac | aaccacagag | aaaaagacaa | ccagagcaac | aacccaaaaa | 480 |
| agggaaaaag | aaaaagaaaa | cacaaaccaa | accacaagca | cagctgcaac | ccaaacaacc | 540 |
| aacaccacca | accaaaccag | aaatgcaagt | gagacaatca | caacatccga | cagaccacaga | 600 |
| attgacacca | caacccaaag | cagcgatcag | acaacccggg | caacagaccc | aagctcccca | 660 |
| ccacaccatg | cacagagtgg | tgcaaaaccc | aaatgaacac | aacacacaaa | catctcatcc | 720 |
| aagtagttaa | caaaaaacca | caaaataacc | ttgaaaacca | aaaaaccaa | ccacaaactt | 780 |
| agccccagaa | aaacatagac | actatatgga | aggtttgagc | atatgcacca | atgaaatggg | 840 |
| atctgttcat | gtatcaatag | cgccaccatt | atttaaggaa | taagaagagg | caaaaattca | 900 |
| a | | | | | | 901 |

<210> 107

<211> 860

<212> DNA

<213> human metapneumo virus

<400> 107

| | | | | | | |
|------------|------------|------------|------------|------------|-------------|-----|
| atggaagtaa | gagtggagaa | cattcgagcg | atagacatgt | tcaaagcaaa | gataaaaaac | 60 |
| cgtataagaa | gcagcaggtg | ctatagaaat | gctacactga | tccttattgg | actaacagcg | 120 |
| ttaagcatgg | cacttaatat | tttcctgac | atcgatcatg | caacattaag | aaacatgatc | 180 |
| aaaacagaaa | attgtgctaa | catgccgccg | gcagaaccaa | gcaaaaagac | cccaatgacc | 240 |
| tctacagcag | gcccacacac | caaacccaat | ccacagcaag | caacacagt | gaccacggag | 300 |
| aactcaacat | tcccagcagc | aacctcagag | ggccatctac | acacagggac | aactcaaaca | 360 |
| ccagacacaa | cagctcctca | gcaaaccaca | gacaaacaca | cagcactgcc | aaaatcaacc | 420 |
| aatgaacaaa | tcacccagac | aaccacagag | aaaaagacaa | ccagagcaac | aacccaaaga | 480 |
| agggaaaaag | ggaaagaaaa | cacaaaccaa | accacaagca | cagctgctac | ccaaacaacc | 540 |
| aacaccacca | accaaatcag | aaatgcaagc | gagacaatca | caacatccga | cagaccacaga | 600 |
| actgactcca | caacccaaag | cagcgaacag | acaacccggg | caacagaccc | aagctcccca | 660 |
| ccacatcatg | cacagggaag | tgcaaaaccc | aaatgaacac | aacacacaaa | catcccattc | 720 |
| aagtagttaa | caaaaaatca | gaccacagaa | aacatagaca | ctatatggaa | ggtccgagca | 780 |
| tatgcaccga | tgaaatggca | tttgttcatg | tatcaatagc | gccaccatta | tttaagggaat | 840 |
| aagaagaggc | aaaaattcaa | | | | | 860 |

<210> 108

<211> 861

<212> DNA

<213> human metapneumo virus

<400> 108

| | | | | | | |
|------------|------------|-------------|------------|------------|-------------|-----|
| atggaagtaa | gagtggagaa | cattcgagcg | atagacatgt | tcaaagcaaa | gataaaaaac | 60 |
| cgtataagaa | gcagcaggtg | ctatagaaat | gctacactga | tccttattgg | actaacagcg | 120 |
| ttaagcatgg | cacttaatat | tttcctgac | atcgatcatg | caacattaag | aaacatgatc | 180 |
| aaaacagaaa | attgtgctaa | catgccgccg | gcagaaccaa | gcagaaagac | cccaatgacc | 240 |
| tccacagcag | gcccacacac | caaacccaat | ccacagcaag | caacacagt | gaccacggag | 300 |
| aactcaacat | ccccagcagc | aacccacagag | ggccatctac | acacagggac | aactcaaaca | 360 |
| ccagacacaa | cagctcctca | gcaaaccaca | gacaaacaca | cagcactgcc | aaaatcaacc | 420 |
| aatgaacaga | tcacccaggc | aaccacagag | aaaaagacaa | ccagagaaac | aacccaaaga | 480 |
| agggaaaaag | gaaaagaaaa | cacaaaccaa | accacaagca | cagctgcaac | ccaaacaacc | 540 |
| aacaccacca | accaaatcag | aaatgcaagc | gagacaatca | caacatccga | cagaccacaga | 600 |
| actgactcca | caacccaaag | cagcgaacag | acaacccagg | caacagaccc | aagctcccca | 660 |
| gcacaccatg | cacagggaag | tgcaaaaccc | aaatgaacac | aacacacaaa | catcccattc | 720 |
| aagtagttaa | caaaaaaatc | agaccacagaa | aaacacagac | actatatgga | aggtccgagc | 780 |
| atatgcaccg | atgaaatggc | atctgttcat | gtatcaatag | caccaccatt | atttaaggaa | 840 |
| taagaagagg | caaaaattca | a | | | | 861 |

<210> 109

<211> 860

<212> DNA

<213> human metapneumo virus

<400> 109

```
atggaagtaa gagtggagaa cattcgagcg atagacatgt tcaaagcaaa gataaaaaaac 60
cgtataagaa gcagcaggtg ctatagaaat gctacattga tccttatttg actaacagcg 120
ttaagcatgg cacttaatat tttcctgatc atcgatcatg caacattaag aaacatgac 180
aaaacagaaa attgtgctaa catgccaccg gcagaaccaa gcaaaaagac cccaatgacc 240
tccacagcag gcctaaacac taaacccaat ccacagcaag caacacagtg gaccacggag 300
aactcaacat ccccagcagc aaccccagag ggccatctac acacagggac aactcaaac 360
ccagacacaa cagctcctca gcaaaccaca gacaagcaca cagcactgcc aaaatcaacc 420
aatgaacaga tcacccagac aaccacagag aaaaagacaa ccagagcaac aacccaaaga 480
agggaaaaag gaaaagaaaa cacaaccaa accacaagca cagctgcaac ccaaacaacc 540
aacaccacca accaaatcag aaatgcaagc gagacaatca caacatccga cagaccaga 600
actgactcca caacccaaag cagcgaacag acaacccggg caacagaccc aagctcccc 660
ccacaccatg cacaggggaag tgcaaaaccc aaatgaacac aacacacaaa catcccatcc 720
aagtagttaa caaaaaatca gaccagaaa aacatagaca ctatatggaa ggtccgagca 780
tatgcaccga tgaaatggca tctgttcacg tatcaatagc gccaccatta ttttaaggaat 840
aagaagaggc aaaaattcaa                                     860
```

<210> 110

<211> 860

<212> DNA

<213> human metapneumo virus

<400> 110

```
atggaagtaa gagtggagaa cattcgagcg atagacatgt tcaaagcaaa gataaaaaaac 60
cgtataagaa gcagcaggtg ctatagaaat gctacactga tccttatttg actaacagcg 120
ttaagcatgg cacttaatat tttcctgatc atcgatcatg caacattaag aaacatgac 180
aaaacagaaa attgtgctaa catgccgccg gcagaaccaa gcaaaaagac cccaatgacc 240
tccacagcag gcccaaacac caaacccaat ccacagcaag caacacagtg gaccacggag 300
aactcaacat ccccagcagc aaccccagag ggccatctac acacagggac aactcaaac 360
ccagacacaa cagctcctca gcaaaccaca gacaacaca cagcactgcc aaaatcaacc 420
aatgaacaga tcacccagac aaccacagag aaaaagacaa ccagagcaac aacccaaaga 480
agggaaaaag gaaaagaaaa cacaaccaa accacaagca cagctgcaac ccaaacaacc 540
aacaccacca accaaatcag aaatgcaatt gagacaatca caacatccga cagaccaga 600
actgactcca caacccaaag cagcgaacag acaacccggg caacagaccc aagctcccc 660
ccacaccatg cacaggggaag tgcaaaaccc aaatgaacac aacacacaaa catcccatcc 720
aagtagttaa caaaaaatca gaccagaaa aacatagaca ctatatggaa ggtccgagca 780
tatgcaccga tgaaatggca tctgttcacg tatcaatagc gccaccatta ttttaaggaat 840
aagaagaggc aagaattcaa                                     860
```

<210> 111

<211> 886

<212> DNA

<213> human metapneumo virus

<400> 111

```
atggaagtaa gagtggagaa cattcgggca atagacatgt tcaaagcaaa aatgaaaaaac 60
cgtataagaa gtagcaagtg ctatagaaat gctacactga tccttatttg attaacagca 120
ttaagtattg cacttaatat ttttttaatc attgattatg caatgttaaa aaacatgacc 180
aaagtggaa actgtgttaa tatgccgccg gtagaaccaa gcaagaagac cccaatgacc 240
tctgcagtag acttaaacac caaacccaat ccacagcagg caacacagtt ggccgcagag 300
gattcaacat ctctagcagc aacctcagag gaccatctac acacagggac aactccaaca 360
ccagatgcaa cagtctctca gcaaaccaca gacgagtaca caacattgct gagatcaacc 420
aacagacaga ccacccaaac aaccacagag aaaaagccaa cgggagcaac aacccaaaaa 480
gaaaccacaa ctcgaaactac aagcacagct gcaacccaaa cactcaacac taccaccaa 540
actagctatg tgagagaggc aaccacaaca tccgccagat ccagaaacag tgccacaact 600
caaagcagcg accaaacaac ccaggcagca gacccaagct cccaaccaca ccatacacag 660
aaaagcacia caacaacata caacacagac acatcctctc caagtagtta acaaaaaaac 720
tataaaataa tcatgaaaac cgaaaaacta gaaaagttaa tttgaactca gaaaagaaca 780
caaacactat atgaattgtt tgagcgtata tactaatgaa atagcatctg tttgtgcac 840
aataatacca tcattattta agaaataaga agaagctaaa attcaa                                     886
```

<210> 112
 <211> 889
 <212> DNA
 <213> human metapneumo virus

<400> 112
 atggaagtaa gagtggagaa cattcggaca atagacatgt tcaaagcaaa gatgaaaaac 60
 cgtataagaa gcagcaagtg ctatagaaat gctacactga tccttattgg actgacagca 120
 ttaagtatgg cacttaatat tttcttgatc atcgattatg caacatttaa aaacatgacc 180
 aaagtggaac actgtgctaa tatgccgccg gtagaaccga gtaagaagac cccaatgacc 240
 tctacagtag actcaagcac cggacccaat ccacagcaga caacacagtg gaccacagag 300
 gattcaacat ctctagcagc aacctcagag gaccatctac acacagggac aactccaaca 360
 ctagatgcaa cagtttctca gcaaacccca gacaagcaca caacaccgct gagatcaacc 420
 aatggacaga ccaccagac aaccacagag aaaaagccaa ccagagcaat agccaaaaaa 480
 gaaaccacaa accaaaccac aagcacagct gcaaccctaaa cattcaacac caccaatcaa 540
 accagaaatg gaagagagac aaccataaca tctgccagat ccagaaacga cgccacaact 600
 caaagcagcg aacaaacaaa ccagacaaca gacccaagct cccaaccaca tcatgcatag 660
 ataagcacia taacaatatg aacacaacac agacacatct tctccaagta gtttaaaaaa 720
 aactataaaa taaccatgaa aaccaaaaaa ctagaaaagt aaatttgaac tcagaaaaga 780
 acacaaacac taaatgaatt gtttgagcat atatactaata gaaatagcat ctgttcacgc 840
 atcaataata ccatcattac ttaagaata agaagaagca aaattcaa 889

<210> 113
 <211> 885
 <212> DNA
 <213> human metapneumo virus

<400> 113
 atggaagtaa gagtggagaa cattcgggca atagacatgt tcaaagcaaa gatgaaaaac 60
 cgtataagaa gtagcaagtg ctatagaaat gctacactga tccttattgg attaacagca 120
 ttaagtatgg cacttaatat ttttttaatc attgattatg caatgttaaa aaacatgacc 180
 aaagtggaac actgtgttaa tatgccgccg gtagaaccga gcaagaagac cccaatgacc 240
 tctgcagtag acttaaacac caaactcaat ccacagcagg caacacagtt gaccacagag 300
 gattcaacat ctctagcagc aacctcggag gatcatttac tcacagggac aactccaaca 360
 ccagatgcaa cagtctctca gcaaaccaca gacgagcaca caacactgct gagatcaacc 420
 aacagacaga ccaccctaac aaccacagag aaaaagccaa ccggagcaac aacccaaaaa 480
 gaaaccacaa ctggaaccac aagcacagct gcaaccctaaa cactcaacac caccaccaa 540
 actagcaatg gaagagaggc aaccacaaca tccaccagat ccagaaacgg tgccacaact 600
 caaaacagcg atcaaaacaac ctagacagca gacccaagct cccaaccaca ccatacacag 660
 aaaagcacia caacaacata caacacagac acatcttctc caagtagtta acaaaaaaact 720
 ataaaataac catgaaaact aaaaaactag aaaagttaat ttgaactcag aaaagaacac 780
 aaacactata tgaattgttt gagcgtatat actaatgaaa tagcatctgt ttgtgcatca 840
 ataataccat cattatttaa gaaataagaa gaagctaaaa ttcaa 885

<210> 114
 <211> 885
 <212> DNA
 <213> human metapneumo virus

<400> 114
 atggaagtaa gagtggagaa cattcgggca atagacatgt tcaaagcaaa gatgaaaaac 60
 cgcataagaa gtagcaagtg ctatagaaat gctacactga tccttattgg attaacagca 120
 ttaagtatgg cacttaatat ttttttaatc attgattatg caacatttaa aaacatgacc 180
 aaagtggaac actgtgttaa tatgccgccg gtagaaccga gcaagaagac cccaatgacc 240
 tctgcagtag acttaaacac caaactcaat ccacagcagg caacacagtt gaccacagag 300
 gattcaacat ctctagcagc aacctcagag ggccatccac acacaggaac aactccaaca 360
 ccagacgcaa cagtctctca gcaaaccaca gacgagcaca caacactgct gagatcaacc 420
 aacagacaga ccaccctaac agccacagag aaaaagccaa ctggagcaac aacccaaaaa 480
 gaaaccacaa cccgaactac aagtacagct gcaaccctaaa caccacacac caccaccaa 540
 accagcaatg gaagagaggc aaccacaaca tccgccaggc ccagaaacgg tgccacaact 600

| | | | | | | |
|------------|------------|------------|------------|------------|------------|-----|
| caaaacagcg | atcaaataac | ccaggcagca | gactcaagct | cccaaccaca | ccatacacag | 660 |
| aaaagcacia | caacagcata | caacacagac | acatcttttc | caagtagtta | acaaaaaact | 720 |
| ataaaataac | catgaaaacc | aaaaaactag | aaaagttaat | ttgaactcag | aaaagaacac | 780 |
| aaacactata | tgaattgttt | gagcgtatat | actaatgaaa | tagcatctgt | ttgtgcatca | 840 |
| ataataccat | cattatttta | gaaataagaa | gaagctaaaa | ttcaa | | 885 |

<210> 115

<211> 886

<212> DNA

<213> human metapneumo virus

<400> 115

| | | | | | | |
|------------|-------------|-------------|-------------|------------|------------|-----|
| atggaagtaa | gagtggagaa | cattcgggca | atagacatgt | tcaaagcaaa | gatgaaaaac | 60 |
| cgtataagaa | gtagcaagt | ctatagaaat | gctacactga | tccttattgg | attaacagca | 120 |
| ctaagtatgg | cacttaatat | ttttttaatc | attgattatg | caacattaaa | aaacatgacc | 180 |
| aaagtggaa | actgtgttaa | tatgccgccg | gtagaaccaa | gcaagaagac | cccaatgacc | 240 |
| tctgcagtag | actcaaacac | caaaccctaat | ccacagcagg | caacacagtt | gaccacagag | 300 |
| gattctacat | cttttagcagc | aacccttagag | gaccatccac | acacagggac | aactccaaca | 360 |
| ccagatgcaa | cagtctctca | gcaaaccaca | gacgagcaca | caacactgct | gagatcaacc | 420 |
| aacagacaga | ccacccaaac | aactgcagag | aaaaagccaa | ccagggcaac | aacccaaaaa | 480 |
| gaaaccacaa | ctcgaaccac | aagcacagct | gcaaccctaaa | cactcaacac | caccaaccaa | 540 |
| actagcaatg | gaagagaggc | aaccacaaca | tctgccagat | ccagaaacaa | tgccacaact | 600 |
| caaagcagcg | atcaaacaac | ccaggcagca | gaaccaagct | cccaatcaca | acatacacag | 660 |
| aaaagcacia | caacaacata | caacacagac | acatcttctc | taagtagtta | acaaaaaaac | 720 |
| tataaaataa | ccatgaaaac | caaaaaacta | gaaaagttaa | tttgaactca | gaaaagaaca | 780 |
| caaacactat | atgaattatt | tgagcgtata | tactaatgaa | atagcatctg | tttgtgcatc | 840 |
| aataatacca | tcattattta | agaaataaga | agaagctaaa | attcaa | | 886 |

<210> 116

<211> 887

<212> DNA

<213> human metapneumo virus

<400> 116

| | | | | | | |
|------------|------------|-------------|-------------|------------|------------|-----|
| atggaagtaa | gagtggagaa | cattcgggca | atagacatgt | tcaaagcaaa | gatgaaaaac | 60 |
| cgtataagaa | gtagcaagt | ctatagaaat | gctacactga | tccttattgg | attatcagca | 120 |
| ctaagtatgg | cacttaatat | ttttttaatc | attgattatg | caaaatcaaa | aaacatgacc | 180 |
| agagtggaa | actgtgtcaa | tatgccgccg | gtagaaccaa | gcaagaagac | cccaatgacc | 240 |
| tctgcagtag | acttaaacac | caaaccctaat | ccacagcggg | caacacagtt | gaccacagag | 300 |
| gattcaacat | ctctagcagc | aacccttagag | ggccatctac | acacagggac | aactccaaca | 360 |
| ccagatgtaa | cagtctctca | gcaaaccaca | gacgagcaca | caacactgct | gagatcaacc | 420 |
| aacagacaga | ccacccaaac | agccgcagag | aaaaagccaa | ccagagtaac | aactaacaac | 480 |
| gaaaccataa | ctcgaaccac | aagcacagcc | gcaaccctaaa | cactcaacac | caccaaccaa | 540 |
| accaacaatg | gaagagaggc | aaccacaaca | tctgccagat | ccagaaacaa | tgccacaact | 600 |
| caaagcagcg | accaaacaac | ccaggcagca | gacccaagct | cccaatcaca | acatacacag | 660 |
| aaaagcacia | caacaacata | caacacagac | acatcttctc | caagtagtta | acaaaaaaac | 720 |
| tataaaataa | ccatgaaaac | caaaaaaact | agaaaagtta | atttgaactc | agaaaagaac | 780 |
| acaaacacta | tatgaattgt | ttgagcgtat | atactaataga | aatagcatct | gtttgtgcat | 840 |
| caataatacc | atcattattt | aagaattaag | aagaagctaa | aattcaa | | 887 |

<210> 117

<211> 887

<212> DNA

<213> human metapneumo virus

<400> 117

| | | | | | | |
|------------|------------|-------------|------------|------------|------------|-----|
| atggaagtaa | gagtggagaa | cattcgggca | atagacatgt | tcaaagcaaa | gatgaaaaac | 60 |
| cgtataagaa | gtagcaagt | ctatagaaat | gctacactga | tccttattgg | attatcagca | 120 |
| ctaagtatgg | cacttaatat | ttttttaatc | attgattatg | caaaatcaaa | aacctgacc | 180 |
| agagtggaa | actgtgttaa | tatgccgccg | gtagaaccaa | gcaagaagac | cccaatgacc | 240 |
| tctgcagtag | acttaaacac | caaaccctaat | ccacagcagg | caacacagtt | gaccacagag | 300 |

```

gattcaacat ctccagcagc aaccctagag ggccatctac acacagggac aactccaaca 360
ccagatgcaa cagtctctca gcaaaccaca gacgagcaca caacactgct gagatcaacc 420
aacagacaga ccacccaaac aaccgcagag aaaaagccaa ccagagcaac aacccaaaaa 480
gaaaccataa ctcgaaaccac aagcacagct gcaacccaaa cactcaacac caccaacca 540
accagcaatg gaagagagggc aaccacaaca tctgccagat ccagaaacaa tgccacaact 600
caaagcagcg accaaacaac ccaggcagca gacccaagct cccaatcaca acatacaaaag 660
aaaagcaca caacaacata caacacagac acatcttctc caagtagtta acaaaaaaac 720
tataaaataa ccatgaaaac caaaaaaact agaaaagtta atttgaactc agaaaagaac 780
acaaacacta tatgaattgt ttgagcgtat atactaatga aatagcatct gtttgtgcat 840
caataatacc atcattatatt aagaattaag aagaagctaa aattcaa 887

```

<210> 118

<211> 886

<212> DNA

<213> human metapneumo virus

<400> 118

```

atggaagtaa gagtggagaa cattcgggca atagacatgt tcaaagcaaa gatgaaaaaac 60
cgtataagaa gtagcaagtg ctatagaaat gctacactga tccttattgg attaacagca 120
ctaagtatgg cacttaatat ttttttaatc attgattatg caacattaaa aaacatgacc 180
aaagtgaac actgtgttaa tatgccgccc gtagaaccaa gcaagaagac cccaatgacc 240
tctgcagtag acttaaacac caaacccaat ccacagcagg caacacagtt gaccacagag 300
gactctacat ctttagcagc aaccctagag gaccatccac acacagggac aactccaaca 360
ccagatgcaa cagtctctca gcaaaccaca gacgagcaca caacactgct gagatcaacc 420
aacagacaga ccacccaaac aactgcagag aaaaagccaa ccagagcaac aacccaaaaa 480
gaaaccacaa ctcgaaaccac aagcacagct gcaacccaaa cactcaacac caccaacca 540
actagcaatg gaagagagggc aaccacaaca tctgccagat ccagaaacaa tgccacaact 600
caaagcagcg atcaaacaac ccaagcagca gaaccaaact cccaatcaca acatacacag 660
aaaagcaca caacaacata caacacagac acatcttctc taagtagtta acaaaaaaac 720
tataaaataa ccatgaaaac caaaaaacta gaaaagttaa tttgaactca gaaaggaaca 780
caaacactat atgaattatt tgagcgtata tactaatgaa atagcatctg tttgtgcatc 840
aataatacca tcattattta agaaataaga agaagctaaa attcaa 886

```

<210> 119

<211> 236

<212> PRT

<213> human metapneumo virus

<400> 119

```

Met Glu Val Lys Val Glu Asn Ile Arg Thr Ile Asp Met Leu Lys Ala
 1          5          10          15
Arg Val Lys Asn Arg Val Ala Arg Ser Lys Cys Phe Lys Asn Ala Ser
 20          25          30
Leu Val Leu Ile Gly Ile Thr Thr Leu Ser Ile Ala Leu Asn Ile Tyr
 35          40          45
Leu Ile Ile Asn Tyr Lys Met Gln Lys Asn Thr Ser Glu Ser Glu His
 50          55          60
His Thr Ser Ser Ser Pro Met Glu Ser Ser Arg Glu Thr Pro Thr Val
 65          70          75          80
Pro Thr Asp Asn Ser Asp Thr Asn Ser Ser Pro Gln His Pro Thr Gln
 85          90          95
Gln Ser Thr Glu Gly Ser Thr Leu Tyr Phe Ala Ala Ser Ala Ser Ser
100          105          110
Pro Glu Thr Glu Pro Thr Ser Thr Pro Asp Thr Thr Asn Arg Pro Pro
115          120          125
Phe Val Asp Thr His Thr Thr Pro Pro Ser Ala Ser Arg Thr Lys Thr
130          135          140
Ser Pro Ala Val His Thr Lys Asn Asn Pro Arg Thr Ser Ser Arg Thr
145          150          155          160
His Ser Pro Pro Arg Ala Thr Thr Arg Thr Ala Arg Arg Thr Thr Thr
165          170          175

```

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Arg | Thr | Ser | Ser | Thr | Arg | Lys | Arg | Pro | Ser | Thr | Ala | Ser | Val | Gln |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Pro | Asp | Ile | Ser | Ala | Thr | Thr | His | Lys | Asn | Glu | Glu | Ala | Ser | Pro | Ala |
| | | 195 | | | | | 200 | | | | | 205 | | | |
| Ser | Pro | Gln | Thr | Ser | Ala | Ser | Thr | Thr | Arg | Ile | Gln | Arg | Lys | Ser | Val |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Glu | Ala | Asn | Thr | Ser | Thr | Thr | Tyr | Asn | Gln | Thr | Ser | | | | |
| 225 | | | | | 230 | | | | | 235 | | | | | |

<210> 120
 <211> 236
 <212> PRT
 <213> human metapneumo virus

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Glu | Val | Lys | Val | Glu | Asn | Ile | Arg | Thr | Ile | Asp | Met | Leu | Lys | Ala |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Ser | Val | Lys | Asn | Arg | Val | Ala | Arg | Ser | Lys | Cys | Phe | Lys | Asn | Ala | Ser |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Leu | Val | Leu | Ile | Gly | Ile | Thr | Thr | Leu | Ser | Ile | Ala | Leu | Asn | Ile | Tyr |
| | 35 | | | | | | 40 | | | | | 45 | | | |
| Leu | Ile | Ile | Asn | Tyr | Lys | Met | Gln | Lys | Asn | Thr | Ser | Glu | Ser | Glu | His |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| His | Thr | Ser | Ser | Ser | Pro | Met | Glu | Ser | Ser | Arg | Glu | Thr | Pro | Thr | Val |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Pro | Thr | Asp | Asn | Ser | Asp | Thr | Asn | Ser | Ser | Pro | Gln | His | Pro | Thr | Gln |
| | | | 85 | | | | | | 90 | | | | | 95 | |
| Gln | Ser | Thr | Glu | Gly | Ser | Thr | Leu | Tyr | Phe | Ala | Ala | Ser | Ala | Ser | Ser |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Pro | Glu | Thr | Glu | Pro | Thr | Ser | Thr | Pro | Asp | Thr | Thr | Asn | Arg | Pro | Pro |
| | 115 | | | | | | 120 | | | | | 125 | | | |
| Phe | Val | Asp | Thr | His | Thr | Thr | Pro | Pro | Ser | Ala | Ser | Arg | Thr | Lys | Thr |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Ser | Pro | Ala | Val | His | Thr | Lys | Asn | Asn | Pro | Arg | Thr | Ser | Ser | Arg | Thr |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| His | Ser | Pro | Pro | Arg | Ala | Thr | Thr | Arg | Thr | Ala | Arg | Arg | Thr | Thr | Thr |
| | | | 165 | | | | | | 170 | | | | | 175 | |
| Leu | Arg | Thr | Ser | Ser | Thr | Arg | Lys | Arg | Pro | Ser | Thr | Ala | Ser | Val | Gln |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Pro | Asp | Ile | Ser | Ala | Thr | Thr | His | Lys | Asn | Glu | Glu | Ala | Ser | Pro | Ala |
| | 195 | | | | | | 200 | | | | | 205 | | | |
| Ser | Pro | Gln | Thr | Ser | Ala | Ser | Thr | Thr | Arg | Ile | Gln | Arg | Lys | Ser | Val |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Glu | Ala | Asn | Thr | Ser | Thr | Thr | Tyr | Asn | Gln | Thr | Ser | | | | |
| 225 | | | | | 230 | | | | | 235 | | | | | |

<210> 121
 <211> 236
 <212> PRT
 <213> human metapneumo virus

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Glu | Val | Lys | Val | Glu | Asn | Ile | Arg | Thr | Ile | Asp | Met | Leu | Lys | Ala |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Arg | Val | Lys | Asn | Arg | Val | Ala | Arg | Ser | Lys | Cys | Phe | Lys | Asn | Ala | Ser |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Leu | Val | Leu | Ile | Gly | Ile | Thr | Thr | Leu | Ser | Ile | Ala | Leu | Asn | Ile | Tyr |
| | 35 | | | | | | 40 | | | | | 45 | | | |
| Leu | Ile | Ile | Asn | Tyr | Lys | Met | Gln | Lys | Asn | Thr | Ser | Glu | Ser | Glu | His |

| | | | | | |
|---------------------|---------------------|-------------------------|-----|----|--|
| 50 | | 55 | | 60 | |
| His Thr Ser Ser Ser | Pro Met Glu Ser Ser | Arg Glu Thr Pro Thr Val | | | |
| 65 | 70 | 75 | 80 | | |
| Pro Thr Asp Asn Ser | Asp Thr Asn Ser Ser | Pro Gln His Pro Thr Gln | | | |
| | 85 | 90 | 95 | | |
| Gln Ser Thr Glu Gly | Ser Thr Leu Tyr Phe | Ala Ala Ser Ala Asn Ser | | | |
| | 100 | 105 | 110 | | |
| Pro Glu Thr Glu Pro | Thr Ser Thr Pro Asp | Thr Thr Asn Arg Pro Pro | | | |
| | 115 | 120 | 125 | | |
| Phe Val Asp Thr His | Thr Thr Pro Pro Ser | Ala Ser Arg Thr Lys Thr | | | |
| | 130 | 135 | 140 | | |
| Ser Pro Ala Val His | Thr Lys Asn Asn Pro | Arg Ile Ser Ser Arg Thr | | | |
| 145 | 150 | 155 | 160 | | |
| His Ser Pro Pro Trp | Ala Thr Thr Arg Thr | Ala Arg Arg Thr Thr Thr | | | |
| | 165 | 170 | 175 | | |
| Leu Arg Thr Ser Ser | Thr Arg Lys Arg Pro | Ser Thr Ala Ser Ala Gln | | | |
| | 180 | 185 | 190 | | |
| Pro Asp Ile Ser Ala | Thr Thr His Lys Asn | Glu Glu Ala Ser Pro Ala | | | |
| | 195 | 200 | 205 | | |
| Ser Pro Gln Thr Ser | Ala Ser Thr Thr Arg | Thr Gln Arg Lys Ser Val | | | |
| | 210 | 215 | 220 | | |
| Glu Ala Asn Thr Ser | Thr Thr Tyr Asn Gln | Thr Ser | | | |
| 225 | 230 | 235 | | | |

<210> 122

<211> 236

<212> PRT

<213> human metapneumo virus

<400> 122

| | | |
|---------------------|---------------------|-------------------------|
| Met Glu Val Lys Val | Glu Asn Ile Arg Thr | Ile Asp Met Leu Lys Ala |
| 1 | 5 | 10 |
| Arg Val Lys Asn Arg | Val Ala Arg Ser Lys | Cys Phe Lys Asn Ala Ser |
| | 20 | 25 |
| Leu Val Leu Ile Gly | Ile Thr Thr Leu Ser | Ile Ala Leu Asn Ile Tyr |
| | 35 | 40 |
| Leu Ile Ile Asn Tyr | Lys Met Gln Lys Asn | Thr Ser Glu Ser Glu His |
| | 50 | 55 |
| His Thr Ser Ser Ser | Pro Met Glu Ser Ser | Arg Glu Thr Pro Thr Val |
| 65 | 70 | 75 |
| Pro Thr Asp Asn Ser | Asp Thr Asn Ser Ser | Pro Gln His Pro Thr Gln |
| | 85 | 90 |
| Gln Ser Thr Glu Gly | Ser Thr Leu Tyr Phe | Ala Ala Ser Ala Asn Ser |
| | 100 | 105 |
| Pro Glu Thr Glu Pro | Thr Ser Thr Pro Asp | Thr Thr Asp Arg Pro Pro |
| | 115 | 120 |
| Phe Val Asp Thr His | Thr Thr Pro Pro Ser | Ala Ser Arg Thr Lys Thr |
| | 130 | 135 |
| Ser Pro Ala Val His | Thr Lys Asn Asn Pro | Arg Ile Ser Ser Arg Thr |
| 145 | 150 | 155 |
| His Ser Pro Pro Trp | Ala Thr Thr Arg Thr | Ala Arg Arg Thr Thr Thr |
| | 165 | 170 |
| Leu Arg Thr Ser Ser | Thr Arg Lys Arg Pro | Ser Thr Ala Ser Val Gln |
| | 180 | 185 |
| Pro Asp Ile Ser Ala | Thr Thr His Lys Asn | Glu Glu Ala Ser Pro Ala |
| | 195 | 200 |
| Ser Pro Gln Thr Ser | Ala Ser Thr Thr Arg | Thr Gln Arg Lys Ser Val |
| | 210 | 215 |
| Glu Ala Asn Thr Ser | Thr Thr Tyr Asn Gln | Thr Ser |
| 225 | 230 | 235 |

<210> 123
 <211> 236
 <212> PRT
 <213> human metapneumo virus

<400> 123
 Met Glu Val Lys Val Glu Asn Ile Arg Thr Ile Asp Met Leu Lys Ala
 1 5 10 15
 Arg Val Lys Asn Arg Val Ala Arg Ser Lys Cys Phe Lys Asn Ala Ser
 20 25 30
 Leu Val Leu Ile Gly Ile Thr Thr Leu Ser Ile Ala Leu Asn Ile Tyr
 35 40 45
 Leu Ile Ile Asn Tyr Lys Met Gln Lys Asn Thr Ser Glu Ser Glu His
 50 55 60
 His Thr Ser Ser Ser Pro Met Glu Ser Ser Arg Glu Thr Pro Thr Val
 65 70 75 80
 Pro Thr Asp Asn Ser Asp Thr Asn Ser Ser Pro Gln His Pro Thr Gln
 85 90 95
 Gln Ser Thr Glu Gly Ser Thr Leu Tyr Phe Ala Ala Ser Ala Ser Ser
 100 105 110
 Pro Glu Thr Glu Pro Thr Ser Thr Pro Asp Thr Thr Asp Arg Pro Pro
 115 120 125
 Phe Val Asp Thr His Thr Thr Pro Pro Ser Ala Ser Arg Thr Lys Thr
 130 135 140
 Ser Pro Ala Val His Thr Lys Asn Asn Pro Arg Ile Ser Ser Arg Thr
 145 150 155 160
 His Ser Pro Pro Trp Ala Thr Thr Arg Thr Ala Arg Arg Thr Thr Thr
 165 170 175
 Leu Arg Thr Ser Ser Thr Arg Lys Arg Pro Ser Thr Ala Ser Val Gln
 180 185 190
 Pro Asp Ile Ser Ala Thr Thr His Lys Asn Glu Glu Ala Ser Pro Ala
 195 200 205
 Ser Pro Gln Thr Ser Ala Ser Thr Thr Arg Thr Gln Arg Lys Ser Val
 210 215 220
 Glu Ala Asn Thr Ser Thr Thr Tyr Asn Gln Thr Ser
 225 230 235

<210> 124
 <211> 236
 <212> PRT
 <213> human metapneumo virus

<400> 124
 Met Glu Val Lys Val Glu Asn Ile Arg Thr Ile Asp Met Leu Lys Ala
 1 5 10 15
 Arg Val Lys Asn Arg Val Ala Arg Ser Lys Cys Phe Lys Asn Ala Ser
 20 25 30
 Leu Ile Leu Ile Gly Ile Thr Thr Leu Ser Ile Ala Leu Asn Ile Tyr
 35 40 45
 Leu Ile Ile Asn Tyr Thr Met Gln Glu Asn Thr Ser Glu Ser Glu His
 50 55 60
 His Thr Ser Ser Ser Pro Met Glu Ser Ser Arg Glu Thr Pro Thr Val
 65 70 75 80
 Pro Ile Asp Asn Ser Asp Thr Asn Pro Gly Ser Gln Tyr Pro Thr Gln
 85 90 95
 Gln Ser Thr Glu Asp Ser Thr Leu His Ser Ala Ala Ser Ala Ser Ser
 100 105 110
 Pro Glu Thr Glu Pro Thr Ser Thr Pro Asp Thr Thr Ser Arg Pro Pro


```

Met Glu Val Lys Val Glu Asn Ile Arg Thr Ile Asp Met Leu Lys Ala
1      5      10      15
Arg Val Lys Asn Arg Val Ala Arg Ser Lys Cys Phe Lys Asn Ala Ser
20      25      30
Leu Ile Leu Ile Gly Ile Thr Thr Leu Ser Ile Ala Leu Asn Ile Tyr
35      40      45
Leu Ile Ile Asn Tyr Thr Met Gln Glu Asn Thr Ser Glu Ser Glu His
50      55      60
His Thr Ser Ser Ser Pro Met Glu Ser Ser Arg Glu Thr Pro Thr Val
65      70      75      80
Pro Met Asp Asn Ser Asp Thr Asn Pro Gly Ser Gln Tyr Pro Thr Gln
85      90      95
Gln Ser Thr Glu Gly Ser Thr Leu His Phe Ala Ala Ser Ala Ser Ser
100      105      110
Pro Glu Thr Glu Pro Thr Ser Thr Pro Asp Thr Thr Ser Arg Pro Pro
115      120      125
Phe Val Asp Thr His Thr Thr Pro Ser Ser Ala Ser Arg Ile Arg Thr
130      135      140
Ser Pro Ala Val His Thr Lys Asn Asn Leu Arg Ile Ser Pro Arg Thr
145      150      155      160
His Ser Pro Pro Trp Ala Met Thr Arg Thr Val Arg Gly Thr Thr Thr
165      170      175
Leu Arg Thr Ser Ser Ile Arg Lys Arg Pro Ser Thr Ala Ser Val Gln
180      185      190
Pro Asp Ser Ser Ala Thr Thr His Lys His Glu Glu Ala Ser Pro Val
195      200      205
Ser Pro Gln Ala Ser Ala Ser Thr Ala Arg Pro Gln Arg Lys Gly Met
210      215      220
Glu Ala Ser Thr Ser Thr Thr Tyr Asn Gln Thr Ser
225      230      235

```

<210> 127

<211> 228

<212> PRT

<213> Human metapneumo virus

<220>

<221> VARIANT

<222> 220

<223> Xaa = unknown amino acid or other

<400> 127

```

Met Glu Val Lys Val Glu Asn Ile Arg Ala Ile Asp Met Leu Lys Ala
1      5      10      15
Arg Val Lys Asn Arg Val Ala Arg Ser Lys Cys Phe Lys Asn Ala Ser
20      25      30
Leu Ile Leu Ile Gly Ile Thr Thr Leu Ser Ile Ala Leu Asn Ile Tyr
35      40      45
Leu Ile Ile Asn Tyr Thr Ile Gln Lys Thr Thr Ser Glu Ser Glu His
50      55      60
His Thr Ser Ser Pro Pro Thr Glu Pro Asn Lys Glu Ala Ser Thr Ile
65      70      75      80
Ser Thr Asp Asn Pro Asp Ile Asn Pro Ser Ser Gln His Pro Thr Gln
85      90      95
Gln Ser Thr Glu Asn Pro Thr Leu Asn Pro Ala Ala Ser Ala Ser Pro
100      105      110
Ser Glu Thr Glu Pro Ala Ser Thr Pro Asp Thr Thr Asn Arg Leu Ser
115      120      125
Ser Val Asp Arg Ser Thr Ala Gln Pro Ser Glu Ser Arg Thr Lys Thr
130      135      140

```

Lys Pro Thr Val His Thr Ile Asn Asn Pro Asn Thr Ala Ser Ser Thr
 145 150 155 160
 Gln Ser Pro Pro Arg Thr Thr Thr Lys Ala Ile Arg Arg Ala Thr Thr
 165 170 175
 Phe Arg Met Ser Ser Thr Gly Lys Arg Pro Thr Thr Thr Leu Val Gln
 180 185 190
 Ser Asp Ser Ser Thr Thr Thr Gln Asn His Glu Glu Thr Gly Ser Ala
 195 200 205
 Asn Pro Gln Ala Ser Ala Ser Thr Met Gln Asn Xaa His Thr Asn Asn
 210 215 220
 Ile Lys Pro Asn
 225

<210> 128

<211> 228

<212> PRT

<213> human metapneumo virus

<400> 128

Met Glu Val Lys Val Glu Asn Ile Arg Ala Ile Asp Met Leu Lys Ala
 1 5 10 15
 Arg Val Lys Asn Arg Val Ala Arg Ser Lys Cys Phe Lys Asn Ala Ser
 20 25 30
 Leu Ile Leu Ile Gly Ile Thr Thr Leu Ser Ile Ala Leu Asn Ile Tyr
 35 40 45
 Leu Ile Ile Asn Tyr Thr Ile Gln Lys Thr Thr Ser Glu Ser Glu His
 50 55 60
 His Thr Ser Ser Pro Pro Thr Glu Ser Asn Lys Glu Thr Ser Thr Ile
 65 70 75 80
 Pro Ile Asp Asn Pro Asp Ile Asn Pro Asn Ser Gln His Pro Thr Gln
 85 90 95
 Gln Ser Thr Glu Ser Pro Thr Leu Asn Pro Ala Ala Ser Val Ser Pro
 100 105 110
 Ser Glu Thr Glu Pro Ala Ser Thr Pro Asp Thr Thr Asn Arg Leu Ser
 115 120 125
 Ser Val Asp Arg Ser Thr Thr Gln Pro Ser Glu Ser Arg Thr Lys Thr
 130 135 140
 Lys Pro Thr Val His Thr Lys Asn Asn Pro Ser Thr Val Ser Arg Thr
 145 150 155 160
 Gln Ser Pro Leu Arg Ala Thr Thr Lys Ala Val Leu Arg Ala Thr Ala
 165 170 175
 Phe Arg Thr Ser Ser Thr Arg Lys Arg Pro Thr Thr Thr Ser Val Gln
 180 185 190
 Ser Asp Ser Ser Thr Thr Thr Gln Asn His Glu Glu Thr Ser Ser Ala
 195 200 205
 Asn Pro Gln Ala Ser Ala Ser Thr Met Gln Ser Gln His Thr Asn Asn
 210 215 220
 Ile Lys Pro Asn
 225

<210> 129

<211> 228

<212> PRT

<213> human metapneumo virus

<400> 129

Met Glu Val Lys Val Glu Asn Ile Arg Ala Val Asp Met Leu Lys Ala
 1 5 10 15
 Arg Val Lys Asn Arg Val Ala Arg Ser Lys Cys Phe Lys Asn Ala Ser

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | 20 | | | | | 25 | | | | 30 | | | | |
| Leu | Ile | Leu | Val | Gly | Ile | Thr | Thr | Leu | Ser | Ile | Ala | Leu | Asn | Ile | Tyr |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Leu | Ile | Val | Asn | Tyr | Thr | Ile | Gln | Lys | Thr | Thr | Ser | Glu | Ser | Glu | His |
| | | 50 | | | | | 55 | | | | | 60 | | | |
| His | Thr | Ser | Ser | Ser | Pro | Thr | Glu | Ser | Asn | Lys | Gly | Thr | Ser | Thr | Ile |
| 65 | | | | | 70 | | | | 75 | | | | | 80 | |
| Pro | Thr | Asp | Asn | Pro | Asp | Ile | Asn | Pro | Asn | Ser | Gln | His | Pro | Thr | Gln |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Gln | Ser | Thr | Glu | Ser | Pro | Thr | Leu | Asn | Thr | Ala | Ala | Ser | Val | Ser | Pro |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Ser | Glu | Thr | Glu | Pro | Ala | Ser | Thr | Pro | Asp | Thr | Thr | Asn | Arg | Leu | Ser |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Ser | Ala | Asp | Arg | Ser | Thr | Thr | Gln | Pro | Ser | Glu | Ser | Arg | Thr | Lys | Thr |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Lys | Leu | Thr | Val | His | Thr | Lys | Asn | Asn | Leu | Ser | Thr | Ala | Ser | Arg | Thr |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Gln | Ser | Pro | Pro | Arg | Ala | Thr | Thr | Lys | Ala | Val | Leu | Arg | Asp | Thr | Ala |
| | | | | 165 | | | | | 170 | | | | | 175 | |
| Phe | His | Thr | Ser | Ser | Thr | Gly | Lys | Arg | Pro | Thr | Thr | Thr | Ser | Val | Gln |
| | | 180 | | | | | | 185 | | | | | 190 | | |
| Ser | Gly | Ser | Ser | Thr | Thr | Thr | Gln | Asn | His | Glu | Glu | Thr | Ser | Ser | Ser |
| | | 195 | | | | | 200 | | | | | 205 | | | |
| Asn | Pro | Gln | Ala | Ser | Ala | Ser | Thr | Met | Gln | Asp | Gln | Asp | Thr | Asn | Asn |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Thr | Lys | Gln | Asn | | | | | | | | | | | | |
| 225 | | | | | | | | | | | | | | | |

<210> 130
 <211> 228
 <212> PRT
 <213> human metapneumo virus

<220>
 <221> VARIANT
 <222> 81
 <223> Xaa = Any Amino Acid

| | | | | | | | | | | | | | | | |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| <400> 130 | | | | | | | | | | | | | | | |
| Met | Glu | Val | Lys | Val | Glu | Asn | Ile | Arg | Ala | Val | Asp | Met | Leu | Lys | Ala |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Arg | Val | Lys | Asn | Arg | Val | Ala | Arg | Ser | Lys | Cys | Phe | Lys | Asn | Ala | Ser |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Leu | Ile | Leu | Val | Gly | Ile | Thr | Thr | Leu | Ser | Ile | Ala | Leu | Asn | Ile | Tyr |
| | | 35 | | | | 40 | | | | | | 45 | | | |
| Leu | Ile | Val | Asn | Tyr | Thr | Ile | Gln | Lys | Thr | Thr | Ser | Glu | Ser | Glu | His |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| His | Thr | Ser | Ser | Ser | Pro | Thr | Glu | Ser | Asn | Lys | Gly | Thr | Ser | Thr | Ile |
| 65 | | | | | 70 | | | | | 75 | | | | 80 | |
| Xaa | Thr | Asp | Asn | Pro | Asp | Ile | Asn | Pro | Asn | Ser | Gln | His | Pro | Thr | Gln |
| | | | 85 | | | | | | 90 | | | | | 95 | |
| Gln | Ser | Thr | Glu | Ser | Pro | Thr | Leu | Asn | Thr | Ala | Ala | Ser | Val | Ser | Pro |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Ser | Glu | Thr | Glu | Pro | Ala | Ser | Thr | Pro | Asp | Thr | Thr | Asn | Arg | Leu | Ser |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Ser | Ala | Asp | Arg | Ser | Thr | Thr | Gln | Pro | Ser | Glu | Ser | Arg | Thr | Lys | Thr |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Lys | Leu | Thr | Val | His | Thr | Lys | Asn | Asn | Leu | Ser | Thr | Ala | Ser | Arg | Thr |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Gln | Ser | Pro | Pro | Arg | Ala | Thr | Thr | Lys | Ala | Val | Leu | Arg | Asp | Thr | Ala |

| | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| | | | | 165 | | | | | 170 | | | | | 175 | | | |
| Phe | His | Thr | Ser | Thr | Gly | Lys | Arg | Pro | Thr | Thr | Thr | Ser | Val | Gln | | | |
| | | | 180 | | | | 185 | | | | | 190 | | | | | |
| Ser | Gly | Ser | Ser | Thr | Thr | Thr | Gln | Asn | His | Glu | Glu | Thr | Ser | Ser | Ser | | |
| | | 195 | | | | | 200 | | | | | 205 | | | | | |
| Asn | Pro | Gln | Ala | Ser | Ala | Ser | Thr | Met | Gln | Asp | Gln | Asp | Thr | Asn | Asn | | |
| | 210 | | | | | | 215 | | | | 220 | | | | | | |
| Thr | Lys | Gln | Asn | | | | | | | | | | | | | | |
| 225 | | | | | | | | | | | | | | | | | |

<210> 131
 <211> 228
 <212> PRT
 <213> Human metapneumo virus

<220>
 <221> VARIANT
 <222> 220
 <223> Xaa = unknown amino acid or other

| | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| | | | | | | | | | | | | | | | | | |
| Met | Glu | Val | Lys | Val | Glu | Asn | Ile | Arg | Ala | Ile | Asp | Met | Leu | Lys | Ala | | |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | | | |
| Arg | Met | Lys | Asn | Arg | Val | Ala | Arg | Ser | Lys | Cys | Phe | Lys | Asn | Ala | Ser | | |
| | | | 20 | | | | | 25 | | | | | 30 | | | | |
| Leu | Ile | Leu | Ile | Gly | Ile | Thr | Thr | Leu | Ser | Ile | Ala | Leu | Asn | Ile | Tyr | | |
| | | 35 | | | | | 40 | | | | | 45 | | | | | |
| Leu | Ile | Ile | Asn | Tyr | Thr | Ile | Gln | Lys | Thr | Thr | Ser | Glu | Ser | Glu | His | | |
| | 50 | | | | | 55 | | | | | 60 | | | | | | |
| His | Thr | Ser | Ser | Pro | Pro | Thr | Glu | Ser | Asn | Lys | Glu | Thr | Ser | Thr | Ile | | |
| 65 | | | | | 70 | | | | 75 | | | | | 80 | | | |
| Pro | Ile | Asp | Asn | Pro | Asp | Ile | Asn | Pro | Asn | Ser | Gln | His | Pro | Thr | Gln | | |
| | | | | 85 | | | | 90 | | | | | 95 | | | | |
| Gln | Ser | Thr | Glu | Ser | Leu | Thr | Leu | Asn | Pro | Ala | Ala | Ser | Val | Ser | Pro | | |
| | | | 100 | | | | | 105 | | | | | 110 | | | | |
| Ser | Glu | Thr | Glu | Pro | Ala | Ser | Thr | Pro | Asp | Thr | Thr | Asn | Arg | Leu | Ser | | |
| | | 115 | | | | | 120 | | | | | 125 | | | | | |
| Ser | Val | Asp | Arg | Ser | Thr | Thr | Gln | Pro | Ser | Glu | Ser | Arg | Thr | Lys | Thr | | |
| | | 130 | | | | 135 | | | | | 140 | | | | | | |
| Lys | Leu | Thr | Val | His | Lys | Lys | Asn | Ile | Pro | Ser | Thr | Val | Ser | Arg | Thr | | |
| 145 | | | | | 150 | | | | 155 | | | | | 160 | | | |
| Gln | Ser | Ser | Ile | Arg | Ala | Thr | Thr | Lys | Ala | Val | Leu | Arg | Ala | Thr | Ala | | |
| | | | | 165 | | | | 170 | | | | | | 175 | | | |
| Phe | Arg | Thr | Ser | Ser | Thr | Gly | Glu | Arg | Pro | Thr | Thr | Thr | Ser | Val | Gln | | |
| | | | 180 | | | | | 185 | | | | | 190 | | | | |
| Ser | Asp | Ser | Ser | Thr | Thr | Thr | Gln | Asn | His | Glu | Glu | Thr | Gly | Ser | Ala | | |
| | | 195 | | | | | 200 | | | | | 205 | | | | | |
| Asn | Pro | Gln | Ala | Ser | Ala | Ser | Thr | Met | Gln | Asn | Xaa | His | Thr | Asn | Ile | | |
| | 210 | | | | | 215 | | | | | 220 | | | | | | |
| Val | Lys | Pro | Asn | | | | | | | | | | | | | | |
| 225 | | | | | | | | | | | | | | | | | |

<210> 132
 <211> 228
 <212> PRT
 <213> Human metapneumovirus

<220>
 <221> VARIANT

<222> 220
 <223> Xaa = unknown amino acid or other

<400> 132

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Glu | Val | Lys | Val | Glu | Asn | Ile | Arg | Ala | Ile | Asp | Met | Leu | Lys | Ala |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Arg | Val | Lys | Asn | Arg | Val | Ala | Arg | Ser | Lys | Cys | Phe | Lys | Asn | Ala | Ser |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Leu | Ile | Leu | Ile | Gly | Ile | Thr | Thr | Leu | Ser | Ile | Ala | Leu | Asn | Ile | Tyr |
| | | 35 | | | | 40 | | | | | | 45 | | | |
| Leu | Ile | Ile | Asn | Tyr | Thr | Ile | Gln | Lys | Thr | Thr | Ser | Glu | Ser | Glu | His |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| His | Thr | Ser | Ser | Pro | Pro | Thr | Glu | Ser | Asn | Lys | Glu | Thr | Ser | Thr | Ile |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Ser | Ile | Asp | Asn | Pro | Asp | Ile | Asn | Pro | Asn | Ser | Gln | His | Pro | Thr | Gln |
| | | | 85 | | | | | | 90 | | | | | 95 | |
| Gln | Ser | Thr | Glu | Ser | Leu | Thr | Leu | Ser | Pro | Thr | Ala | Ser | Val | Ser | Pro |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Ser | Glu | Thr | Glu | Pro | Ala | Ser | Thr | Ser | Asp | Thr | Thr | Ser | Arg | Leu | Ser |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Ser | Val | Asp | Arg | Ser | Thr | Thr | Gln | Pro | Ser | Glu | Ser | Arg | Ala | Arg | Thr |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Lys | Pro | Thr | Val | His | Lys | Lys | Asn | Ile | Pro | Ser | Thr | Val | Ser | Arg | Thr |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Gln | Ser | Pro | Leu | Arg | Ala | Thr | Thr | Lys | Ala | Val | Leu | Arg | Ala | Thr | Ala |
| | | | 165 | | | | | | 170 | | | | | 175 | |
| Phe | Arg | Thr | Ser | Ser | Thr | Gly | Glu | Gly | Pro | Thr | Thr | Thr | Ser | Val | Gln |
| | | 180 | | | | | 185 | | | | | | 190 | | |
| Ser | Asp | Ser | Ser | Thr | Thr | Thr | Gln | Asn | His | Glu | Glu | Thr | Gly | Ser | Ala |
| | 195 | | | | | 200 | | | | | | 205 | | | |
| Asn | Pro | Gln | Ala | Ser | Ala | Ser | Thr | Met | Gln | Asn | Xaa | His | Thr | Asn | Ile |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Val | Lys | Pro | Asn | | | | | | | | | | | | |
| 225 | | | | | | | | | | | | | | | |

<210> 133
 <211> 228
 <212> PRT
 <213> Human metapneumovirus

<220>
 <221> VARIANT
 <222> 220
 <223> Xaa = unknown amino acid or other

<400> 133

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Glu | Val | Lys | Val | Glu | Asn | Ile | Arg | Ala | Ile | Asp | Met | Leu | Lys | Ala |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Arg | Val | Lys | Asn | Arg | Val | Ala | Arg | Ser | Lys | Cys | Phe | Lys | Asn | Ala | Ser |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Leu | Ile | Leu | Ile | Gly | Ile | Thr | Thr | Leu | Ser | Ile | Ala | Leu | Asn | Ile | Tyr |
| | | 35 | | | | 40 | | | | | | 45 | | | |
| Leu | Ile | Ile | Asn | Tyr | Thr | Ile | Gln | Lys | Thr | Thr | Ser | Glu | Ser | Glu | His |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| His | Thr | Ser | Ser | Pro | Pro | Thr | Glu | Ser | Asn | Lys | Glu | Ala | Ser | Thr | Ile |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Ser | Thr | Asp | Asn | Pro | Asp | Ile | Asn | Pro | Asn | Ser | Gln | His | Pro | Thr | Gln |
| | | | 85 | | | | | | 90 | | | | | 95 | |
| Gln | Ser | Thr | Glu | Asn | Pro | Thr | Leu | Asn | Pro | Ala | Ala | Ser | Val | Ser | Ser |
| | | | 100 | | | | | 105 | | | | | 110 | | |

Ser Glu Thr Glu Pro Ala Ser Thr Pro Asp Thr Thr Asn Arg Leu Ser
 115 120 125
 Ser Val Asp Arg Ser Thr Ala Gln Pro Ser Glu Ser Arg Thr Lys Thr
 130 135 140
 Lys Pro Thr Val His Thr Arg Asn Asn Pro Ser Thr Ala Ser Ser Thr
 145 150 155 160
 Gln Ser Pro Pro Arg Val Thr Thr Lys Ala Ile Leu Arg Ala Thr Val
 165 170 175
 Phe Arg Met Ser Ser Thr Gly Lys Arg Pro Ala Thr Thr Leu Val Gln
 180 185 190
 Ser Asp Ser Ser Thr Thr Thr Gln Asn His Glu Glu Thr Gly Ser Ala
 195 200 205
 Asn Ser Gln Ala Ser Ala Ser Thr Met Gln Asn Xaa His Ser Asn Asn
 210 215 220
 Ile Lys Pro Asn
 225

<210> 134
 <211> 228
 <212> PRT
 <213> human metapneumo virus

<400> 134
 Met Glu Val Lys Val Glu Asn Ile Arg Ala Ile Asp Met Leu Lys Ala
 1 5 10 15
 Arg Val Lys Asn Arg Val Ala Arg Ser Lys Cys Phe Lys Asn Ala Ser
 20 25 30
 Leu Ile Leu Ile Gly Ile Thr Thr Leu Ser Ile Ala Leu Asn Ile Tyr
 35 40 45
 Leu Ile Ile Asn Tyr Thr Ile Gln Lys Thr Thr Ser Glu Ser Glu His
 50 55 60
 His Thr Ser Ser Pro Pro Thr Glu Ser Asn Lys Glu Thr Ser Thr Ile
 65 70 75 80
 Ser Ile Asp Asn Ser Asp Ile Asn Pro Asn Ser Gln His Pro Thr Gln
 85 90 95
 Gln Ser Thr Glu Ser Leu Thr Leu Ser Pro Thr Ala Ser Val Ser Pro
 100 105 110
 Ser Glu Thr Glu Pro Ala Ser Thr Ser Asp Thr Thr Asn Arg Leu Ser
 115 120 125
 Ser Val Asp Arg Ser Thr Thr Gln Pro Ser Glu Ser Arg Ala Arg Thr
 130 135 140
 Lys Pro Thr Val His Lys Lys Asn Ile Pro Ser Thr Val Ser Arg Thr
 145 150 155 160
 Gln Ser Pro Leu Arg Ala Thr Thr Lys Ala Val Leu Arg Ala Thr Ala
 165 170 175
 Phe Arg Met Ser Ser Thr Gly Glu Gly Pro Thr Thr Thr Ser Val Gln
 180 185 190
 Ser Asp Ser Ser Thr Thr Thr Gln Asn His Glu Glu Thr Gly Ser Ala
 195 200 205
 Asn Pro Gln Ala Ser Ala Ser Thr Met Gln Asn Gln His Thr Asn Ile
 210 215 220
 Ala Lys Pro Asn
 225

<210> 135
 <211> 228
 <212> PRT
 <213> human metapneumo virus

<400> 135

```
Met Glu Val Lys Val Glu Asn Ile Arg Ala Ile Asp Met Leu Lys Ala
 1          5          10          15
Arg Val Lys Asn Arg Val Ala Arg Ser Lys Cys Phe Lys Asn Ala Ser
      20          25          30
Leu Ile Leu Ile Gly Ile Thr Thr Leu Ser Ile Ala Leu Asn Ile Tyr
      35          40          45
Leu Ile Ile Asn Tyr Thr Ile Gln Lys Thr Thr Ser Glu Ser Glu His
      50          55          60
His Thr Ser Ser Pro Pro Thr Glu Ser Asn Lys Glu Thr Ser Thr Ile
      65          70          75          80
Pro Ile Asp Asn Pro Asp Ile Asn Pro Asn Ser Gln His Pro Thr Gln
      85          90          95
Gln Ser Thr Glu Ser Leu Thr Leu Tyr Pro Thr Ser Ser Val Ser Ser
      100          105          110
Ser Glu Thr Glu Pro Ala Ser Thr Pro Gly Ile Thr Asn His Leu Ser
      115          120          125
Phe Val Asp Arg Ser Thr Thr Gln Pro Ser Glu Ser Arg Thr Lys Thr
      130          135          140
Asn Arg Thr Val His Lys Lys Asn Ile Ser Ser Thr Val Ser Arg Thr
      145          150          155          160
Gln Ser Pro Pro Arg Thr Thr Ala Lys Ala Val Pro Arg Ala Thr Ala
      165          170          175
Leu Arg Thr Ser Ser Thr Gly Glu Arg Pro Thr Thr Thr Pro Val Gln
      180          185          190
Pro Asp Ser Ser Thr Thr Thr Gln Asn His Glu Glu Thr Gly Ser Ala
      195          200          205
Asn Pro Gln Ala Ser Ala Ser Thr Met Gln Asn Gln His Thr Asn Ile
      210          215          220
Ala Arg Pro Asn
225
```

<210> 136

<211> 228

<212> PRT

<213> human metapneumo virus

<400> 136

```
Met Glu Val Lys Val Glu Asn Ile Arg Ala Ile Asp Met Leu Lys Ala
 1          5          10          15
Arg Val Lys Asn Arg Val Ala Arg Ser Lys Cys Phe Lys Asn Ala Ser
      20          25          30
Leu Ile Leu Ile Gly Ile Thr Thr Leu Ser Ile Ala Leu Asn Ile Tyr
      35          40          45
Leu Ile Ile Asn Tyr Thr Ile Gln Lys Thr Thr Ser Glu Ser Glu His
      50          55          60
His Thr Ser Ser Pro Pro Thr Glu Ser Asn Lys Glu Thr Ser Thr Ile
      65          70          75          80
Pro Ile Asp Asn Pro Asp Ile Asn Pro Asn Ser Gln His Pro Thr Gln
      85          90          95
Gln Ser Ala Glu Ser Leu Thr Leu Tyr Pro Thr Ser Ser Val Ser Ser
      100          105          110
Ser Glu Thr Glu Pro Ala Ser Thr Pro Gly Ile Thr Asn His Leu Ser
      115          120          125
Phe Val Asp Arg Ser Thr Thr Gln Pro Ser Glu Ser Arg Thr Lys Thr
      130          135          140
Asn Arg Thr Val His Lys Lys Asn Ile Ser Ser Thr Val Ser Arg Thr
      145          150          155          160
Gln Ser Pro Pro Arg Thr Thr Ala Lys Ala Val Pro Arg Ala Thr Ala
      165          170          175
```


Leu Arg Thr Ser Ser Thr Gly Glu Arg Pro Thr Thr Thr Pro Val Gln
 180 185 190
 Pro Asp Ser Ser Thr Thr Thr Gln Asn His Glu Glu Thr Gly Ser Ala
 195 200 205
 Asn Pro Gln Ala Ser Ala Ser Thr Met Gln Asn Gln His Thr Asn Ile
 210 215 220
 Ala Arg Pro Asn
 225

<210> 137
 <211> 228
 <212> PRT
 <213> human metapneumo virus

<400> 137
 Met Glu Val Lys Val Glu Asn Ile Arg Ala Ile Asp Met Leu Lys Ala
 1 5 10 15
 Arg Val Lys Asn Arg Val Ala Arg Ser Lys Cys Phe Lys Asn Ala Ser
 20 25 30
 Leu Ile Leu Ile Gly Ile Thr Thr Leu Ser Ile Ala Leu Asn Ile Tyr
 35 40 45
 Leu Ile Ile Asn Tyr Thr Ile Gln Lys Thr Thr Ser Glu Ser Glu His
 50 55 60
 His Thr Ser Ser Pro Pro Thr Glu Ser Asn Lys Glu Thr Ser Thr Ile
 65 70 75 80
 Pro Ile Asp Asn Pro Asp Ile Asn Pro Asn Ser Gln His Pro Thr Gln
 85 90 95
 Gln Ser Thr Glu Ser Leu Thr Leu Tyr Pro Thr Ser Ser Val Ser Ser
 100 105 110
 Ser Glu Thr Glu Pro Ala Ser Thr Pro Gly Ile Thr Asn His Leu Ser
 115 120 125
 Phe Val Asp Arg Ser Thr Thr Gln Pro Ser Glu Ser Arg Thr Lys Thr
 130 135 140
 Asn Arg Thr Val His Lys Lys Asn Ile Ser Ser Thr Val Ser Arg Thr
 145 150 155 160
 Gln Ser Pro Pro Arg Thr Thr Ala Lys Ala Val Pro Arg Ala Thr Ala
 165 170 175
 Leu Arg Thr Ser Ser Thr Gly Glu Arg Pro Thr Thr Thr Pro Val Gln
 180 185 190
 Pro Asp Ser Ser Thr Thr Thr Gln Asn His Glu Glu Thr Gly Ser Ala
 195 200 205
 Asn Pro Gln Ala Ser Ala Ser Thr Met Gln Asn Gln His Thr Asn Ile
 210 215 220
 Ala Arg Pro Asn
 225

<210> 138
 <211> 228
 <212> PRT
 <213> human metapneumo virus

<400> 138
 Met Glu Val Lys Val Glu Asn Ile Arg Ala Ile Asp Met Leu Lys Ala
 1 5 10 15
 Arg Val Lys Asn Arg Val Ala Arg Ser Lys Cys Phe Lys Asn Ala Ser
 20 25 30
 Leu Ile Leu Ile Gly Ile Thr Thr Leu Ser Ile Ala Leu Asn Ile Tyr
 35 40 45
 Leu Ile Ile Asn Tyr Thr Ile Gln Gln Thr Thr Ser Glu Ser Glu His

| | | | | |
|---|-----|-----|-----|-----|
| 50 | | 55 | | 60 |
| His Thr Ser Ser Pro Pro Thr Glu Ser Asn Lys Glu Ala Ser Thr Ile | | | | |
| 65 | | 70 | | 80 |
| Ser Thr Asp Asn Pro Asp Ile Asn Pro Asn Ser Gln His Pro Thr Gln | | | | |
| | 85 | | 90 | 95 |
| Gln Ser Thr Glu Asn Pro Thr Leu Asn Pro Ala Ala Ser Ala Ser Pro | | | | |
| | 100 | | 105 | 110 |
| Ser Glu Thr Glu Ser Ala Ser Thr Pro Asp Thr Thr Asn Arg Leu Ser | | | | |
| | 115 | | 120 | 125 |
| Ser Val Asp Arg Ser Thr Val Gln Pro Ser Glu Asn Arg Thr Lys Thr | | | | |
| | 130 | | 135 | 140 |
| Lys Leu Thr Val His Thr Arg Asn Asn Leu Ser Thr Ala Ser Ser Thr | | | | |
| 145 | | 150 | | 160 |
| Gln Ser Pro Pro Arg Ala Thr Thr Lys Ala Ile Arg Arg Ala Thr Thr | | | | |
| | 165 | | 170 | 175 |
| Leu Arg Met Ser Ser Thr Gly Arg Arg Pro Thr Thr Thr Leu Val Gln | | | | |
| | 180 | | 185 | 190 |
| Ser Asp Ser Ser Thr Thr Thr Gln Asn His Glu Glu Thr Gly Ser Ala | | | | |
| | 195 | | 200 | 205 |
| Asn Pro Gln Ala Ser Ala Ser Thr Met Gln Asn Gln His Thr Asn Asn | | | | |
| | 210 | | 215 | 220 |
| Ile Lys Pro Asn | | | | |
| 225 | | | | |

<210> 139

<211> 228

<212> PRT

<213> human metapneumo virus

<400> 139

| | | |
|---|-----|-----|
| Met Glu Val Lys Val Glu Asn Ile Arg Ala Ile Asp Met Leu Lys Ala | | |
| 1 | 5 | 10 |
| Arg Val Lys Asn Arg Val Ala Arg Ser Lys Cys Phe Lys Asn Ala Ser | | |
| | 20 | 25 |
| Leu Ile Leu Ile Gly Ile Thr Thr Leu Ser Ile Ala Leu Asn Ile Tyr | | |
| | 35 | 40 |
| Leu Ile Ile Asn Tyr Thr Ile Gln Lys Thr Thr Ser Glu Ser Glu His | | |
| | 50 | 55 |
| His Thr Ser Ser Pro Pro Thr Glu Ser Asn Lys Glu Ala Ser Thr Ile | | |
| 65 | 70 | 75 |
| Ser Thr Asp Asn Pro Asp Ile Asn Pro Asn Ser Gln His Pro Thr Gln | | |
| | 85 | 90 |
| Gln Ser Thr Glu Asn Pro Thr Leu Asn Pro Ala Ala Ser Ala Ser Pro | | |
| | 100 | 105 |
| Ser Glu Thr Glu Ser Ala Ser Thr Pro Asp Thr Thr Asn Arg Leu Ser | | |
| | 115 | 120 |
| Ser Val Asp Arg Ser Thr Val Gln Pro Ser Glu Asn Arg Thr Lys Thr | | |
| | 130 | 135 |
| Lys Leu Thr Val His Thr Arg Asn Asn Leu Ser Thr Ala Ser Ser Thr | | |
| 145 | 150 | 155 |
| Gln Ser Pro Pro Arg Ala Thr Thr Lys Ala Ile Arg Arg Ala Thr Thr | | |
| | 165 | 170 |
| Leu Arg Met Ser Ser Thr Gly Arg Arg Pro Thr Thr Thr Leu Val Gln | | |
| | 180 | 185 |
| Ser Asp Ser Ser Thr Thr Thr Gln Asn His Glu Glu Thr Gly Ser Ala | | |
| | 195 | 200 |
| Asn Pro Gln Ala Ser Ala Ser Thr Met Gln Asn Gln His Thr Asn Asn | | |
| | 210 | 215 |
| Ile Lys Pro Asn | | |
| 225 | | |

<210> 140
 <211> 231
 <212> PRT
 <213> Human metapneumo virus

<220>
 <221> VARIANT
 <222> 225
 <223> Xaa = unknown amino acid or other

<400> 140
 Met Glu Val Arg Val Glu Asn Ile Arg Ala Ile Asp Met Phe Lys Ala
 1 5 10 15
 Lys Ile Lys Asn Arg Ile Arg Ser Ser Arg Cys Tyr Arg Asn Ala Thr
 20 25 30
 Leu Ile Leu Ile Gly Leu Thr Ala Leu Ser Met Ala Leu Asn Ile Phe
 35 40 45
 Leu Ile Ile Asp His Ala Thr Leu Arg Asn Met Ile Lys Thr Glu Asn
 50 55 60
 Cys Ala Asn Met Pro Ser Ala Glu Pro Ser Lys Lys Thr Pro Met Thr
 65 70 75 80
 Ser Thr Ala Gly Pro Asn Thr Lys Pro Asn Pro Gln Gln Ala Thr Gln
 85 90 95
 Trp Thr Thr Glu Asn Ser Thr Ser Pro Val Ala Thr Pro Glu Gly His
 100 105 110
 Pro Tyr Thr Gly Thr Thr Gln Thr Ser Asp Thr Thr Ala Pro Gln Gln
 115 120 125
 Thr Thr Asp Lys His Thr Ala Pro Leu Lys Ser Thr Asn Glu Gln Ile
 130 135 140
 Thr Gln Thr Thr Thr Glu Lys Lys Thr Ile Arg Ala Thr Thr Gln Lys
 145 150 155 160
 Arg Glu Lys Gly Lys Glu Asn Thr Asn Gln Thr Thr Ser Thr Ala Ala
 165 170 175
 Thr Gln Thr Thr Asn Thr Thr Asn Gln Ile Arg Asn Ala Ser Glu Thr
 180 185 190
 Ile Thr Thr Ser Asp Arg Pro Arg Thr Asp Thr Thr Thr Gln Ser Ser
 195 200 205
 Glu Gln Thr Thr Arg Ala Thr Asp Pro Ser Ser Pro Pro His His Ala
 210 215 220
 Xaa Arg Gly Ala Lys Leu Lys
 225 230

<210> 141
 <211> 231
 <212> PRT
 <213> human metapneumo virus

<400> 141
 Met Glu Val Arg Val Glu Asn Ile Arg Ala Ile Asp Met Phe Lys Ala
 1 5 10 15
 Lys Ile Lys Asn Arg Ile Arg Ser Ser Arg Cys Tyr Arg Asn Ala Thr
 20 25 30
 Leu Ile Leu Ile Gly Leu Thr Ala Leu Ser Met Ala Leu Asn Ile Phe
 35 40 45
 Leu Ile Ile Asp His Ala Thr Leu Arg Asn Met Ile Lys Thr Glu Asn
 50 55 60
 Cys Ala Asn Met Pro Ser Ala Glu Pro Ser Lys Lys Thr Pro Met Thr
 65 70 75 80

Ser Thr Ala Gly Pro Ser Thr Glu Pro Asn Pro Gln Gln Ala Thr Gln
 85 90 95
 Trp Thr Thr Glu Asn Ser Thr Ser Pro Ala Ala Thr Leu Glu Ser His
 100 105 110
 Pro Tyr Thr Gly Thr Thr Gln Thr Pro Asp Ile Thr Ala Pro Gln Gln
 115 120 125
 Thr Thr Asp Lys His Thr Ala Leu Pro Lys Ser Thr Asn Glu Gln Ile
 130 135 140
 Thr Gln Thr Thr Thr Glu Lys Lys Thr Thr Arg Ala Thr Thr Gln Lys
 145 150 155 160
 Arg Glu Lys Glu Lys Glu Asn Thr Asn Gln Thr Thr Ser Thr Ala Ala
 165 170 175
 Thr Gln Thr Thr Asn Thr Thr Asn Gln Thr Arg Asn Ala Ser Glu Thr
 180 185 190
 Ile Thr Thr Ser Asp Arg Pro Arg Ile Asp Thr Thr Thr Gln Ser Ser
 195 200 205
 Asp Gln Thr Thr Arg Ala Thr Asp Pro Ser Ser Pro Pro His His Ala
 210 215 220
 Gln Ser Gly Ala Lys Pro Lys
 225 230

<210> 142
 <211> 231
 <212> PRT
 <213> human metapneumo virus

<400> 142
 Met Glu Val Arg Val Glu Asn Ile Arg Ala Ile Asp Met Phe Lys Ala
 1 5 10 15
 Lys Ile Lys Asn Arg Ile Arg Ser Ser Arg Cys Tyr Arg Asn Ala Thr
 20 25 30
 Leu Ile Leu Ile Gly Leu Thr Ala Leu Ser Met Ala Leu Asn Ile Phe
 35 40 45
 Leu Ile Ile Asp His Ala Thr Leu Arg Asn Met Ile Lys Thr Glu Asn
 50 55 60
 Cys Ala Asn Met Pro Pro Ala Glu Pro Ser Lys Lys Thr Pro Met Thr
 65 70 75 80
 Ser Thr Ala Gly Pro Asn Thr Lys Pro Asn Pro Gln Gln Ala Thr Gln
 85 90 95
 Trp Thr Thr Glu Asn Ser Thr Phe Pro Ala Ala Thr Ser Glu Gly His
 100 105 110
 Leu His Thr Gly Thr Thr Gln Thr Pro Asp Thr Thr Ala Pro Gln Gln
 115 120 125
 Thr Thr Asp Lys His Thr Ala Leu Pro Lys Ser Thr Asn Glu Gln Ile
 130 135 140
 Thr Gln Thr Thr Thr Glu Lys Lys Thr Thr Arg Ala Thr Thr Gln Arg
 145 150 155 160
 Arg Glu Lys Gly Lys Glu Asn Thr Asn Gln Thr Thr Ser Thr Ala Ala
 165 170 175
 Thr Gln Thr Thr Asn Thr Thr Asn Gln Ile Arg Asn Ala Ser Glu Thr
 180 185 190
 Ile Thr Thr Ser Asp Arg Pro Arg Thr Asp Ser Thr Thr Gln Ser Ser
 195 200 205
 Glu Gln Thr Thr Arg Ala Thr Asp Pro Ser Ser Pro Pro His His Ala
 210 215 220
 Gln Gly Ser Ala Lys Pro Lys
 225 230

<210> 143

<211> 231
 <212> PRT
 <213> human metapneumo virus

<400> 143
 Met Glu Val Arg Val Glu Asn Ile Arg Ala Ile Asp Met Phe Lys Ala
 1 5 10 15
 Lys Ile Lys Asn Arg Ile Arg Ser Ser Arg Cys Tyr Arg Asn Ala Thr
 20 25 30
 Leu Ile Leu Ile Gly Leu Thr Ala Leu Ser Met Ala Leu Asn Ile Phe
 35 40 45
 Leu Ile Ile Asp His Ala Thr Leu Arg Asn Met Ile Lys Thr Glu Asn
 50 55 60
 Cys Ala Asn Met Pro Pro Ala Glu Pro Ser Arg Lys Thr Pro Met Thr
 65 70 75 80
 Ser Thr Ala Gly Pro Asn Thr Lys Pro Asn Pro Gln Gln Ala Thr Gln
 85 90 95
 Trp Thr Thr Glu Asn Ser Thr Ser Pro Ala Ala Thr Pro Glu Gly His
 100 105 110
 Leu His Thr Gly Thr Thr Gln Thr Pro Asp Thr Thr Ala Pro Gln Gln
 115 120 125
 Thr Thr Asp Lys His Thr Ala Leu Pro Lys Ser Thr Asn Glu Gln Ile
 130 135 140
 Thr Gln Ala Thr Thr Glu Lys Lys Thr Thr Arg Glu Thr Thr Gln Arg
 145 150 155 160
 Arg Glu Lys Gly Lys Glu Asn Thr Asn Gln Thr Thr Ser Thr Ala Ala
 165 170 175
 Thr Gln Thr Thr Asn Thr Thr Asn Gln Ile Arg Asn Ala Ser Glu Thr
 180 185 190
 Ile Thr Thr Ser Asp Arg Pro Arg Thr Asp Ser Thr Thr Gln Ser Ser
 195 200 205
 Glu Gln Thr Thr Gln Ala Thr Asp Pro Ser Ser Pro Ala His His Ala
 210 215 220
 Gln Gly Ser Ala Lys Pro Lys
 225 230

<210> 144
 <211> 231
 <212> PRT
 <213> human metapneumo virus

<400> 144
 Met Glu Val Arg Val Glu Asn Ile Arg Ala Ile Asp Met Phe Lys Ala
 1 5 10 15
 Lys Ile Lys Asn Arg Ile Arg Ser Ser Arg Cys Tyr Arg Asn Ala Thr
 20 25 30
 Leu Ile Leu Ile Gly Leu Thr Ala Leu Ser Met Ala Leu Asn Ile Phe
 35 40 45
 Leu Ile Ile Asp His Ala Thr Leu Arg Asn Met Ile Lys Thr Glu Asn
 50 55 60
 Cys Ala Asn Met Pro Pro Ala Glu Pro Ser Lys Lys Thr Pro Met Thr
 65 70 75 80
 Ser Thr Ala Gly Leu Asn Thr Lys Pro Asn Pro Gln Gln Ala Thr Gln
 85 90 95
 Trp Thr Thr Glu Asn Ser Thr Ser Pro Ala Ala Thr Pro Glu Gly His
 100 105 110
 Leu His Thr Gly Thr Thr Gln Thr Pro Asp Thr Thr Ala Pro Gln Gln
 115 120 125
 Thr Thr Asp Lys His Thr Ala Leu Pro Lys Ser Thr Asn Glu Gln Ile
 130 135 140

Thr Gln Thr Thr Thr Glu Lys Lys Thr Thr Arg Ala Thr Thr Gln Arg
 145 150 155 160
 Arg Glu Lys Gly Lys Glu Asn Thr Asn Gln Thr Thr Ser Thr Ala Ala
 165 170 175
 Thr Gln Thr Thr Asn Thr Thr Asn Gln Ile Arg Asn Ala Ser Glu Thr
 180 185 190
 Ile Thr Thr Ser Asp Arg Pro Arg Thr Asp Ser Thr Thr Gln Ser Ser
 195 200 205
 Glu Gln Thr Thr Arg Ala Thr Asp Pro Ser Ser Pro Pro His His Ala
 210 215 220
 Gln Gly Ser Ala Lys Pro Lys
 225 230

<210> 145
 <211> 231
 <212> PRT
 <213> human metapneumo virus

<400> 145
 Met Glu Val Arg Val Glu Asn Ile Arg Ala Ile Asp Met Phe Lys Ala
 1 5 10 15
 Lys Ile Lys Asn Arg Ile Arg Ser Ser Arg Cys Tyr Arg Asn Ala Thr
 20 25 30
 Leu Ile Leu Ile Gly Leu Thr Ala Leu Ser Met Ala Leu Asn Ile Phe
 35 40 45
 Leu Ile Ile Asp His Ala Thr Leu Arg Asn Met Ile Lys Thr Glu Asn
 50 55 60
 Cys Ala Asn Met Pro Pro Ala Glu Pro Ser Lys Lys Thr Pro Met Thr
 65 70 75 80
 Ser Thr Ala Gly Pro Asn Thr Lys Pro Asn Pro Gln Gln Ala Thr Gln
 85 90 95
 Trp Thr Thr Glu Asn Ser Thr Ser Pro Ala Ala Thr Pro Glu Gly His
 100 105 110
 Leu His Thr Gly Thr Thr Gln Thr Pro Asp Thr Thr Ala Pro Gln Gln
 115 120 125
 Thr Thr Asp Lys His Thr Ala Leu Pro Lys Ser Thr Asn Glu Gln Ile
 130 135 140
 Thr Gln Thr Thr Thr Glu Lys Lys Thr Thr Arg Ala Thr Thr Gln Arg
 145 150 155 160
 Arg Glu Lys Gly Lys Glu Asn Thr Asn Gln Thr Thr Ser Thr Ala Ala
 165 170 175
 Thr Gln Thr Thr Asn Thr Thr Asn Gln Ile Arg Asn Ala Ile Glu Thr
 180 185 190
 Ile Thr Thr Ser Asp Arg Pro Arg Thr Asp Ser Thr Thr Gln Ser Ser
 195 200 205
 Glu Gln Thr Thr Arg Ala Thr Asp Pro Ser Ser His Pro His His Ala
 210 215 220
 Gln Gly Ser Ala Lys Pro Lys
 225 230

<210> 146
 <211> 236
 <212> PRT
 <213> human metapneumo virus

<400> 146
 Met Glu Val Arg Val Glu Asn Ile Arg Ala Ile Asp Met Phe Lys Ala
 1 5 10 15
 Lys Met Lys Asn Arg Ile Arg Ser Ser Lys Cys Tyr Arg Asn Ala Thr

| | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| | | | | 165 | | | | | 170 | | | | | 175 | | | |
| Thr | Thr | Asn | Gln | Thr | Arg | Asn | Gly | Arg | Glu | Thr | Thr | Ile | Thr | Ser | Ala | | |
| | | | 180 | | | | | 185 | | | | | 190 | | | | |
| Arg | Ser | Arg | Asn | Asp | Ala | Thr | Thr | Gln | Ser | Ser | Glu | Gln | Thr | Asn | Gln | | |
| | | 195 | | | | | 200 | | | | | 205 | | | | | |
| Thr | Thr | Asp | Pro | Ser | Ser | Gln | Pro | His | His | Ala | Xaa | Ile | Ser | Thr | Ile | | |
| | 210 | | | | | 215 | | | | | 220 | | | | | | |
| Thr | Ile | Xaa | Thr | Gln | His | Arg | His | Ile | Phe | Ser | Lys | | | | | | |
| 225 | | | | | 230 | | | | | 235 | | | | | | | |

<210> 148
 <211> 236
 <212> PRT
 <213> Human metapneumo virus

<220>
 <221> VARIANT
 <222> 208
 <223> Xaa = unknown amino acid or other

| | | | | | | | | | | | | | | | | | |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| <400> 148 | | | | | | | | | | | | | | | | | |
| Met | Glu | Val | Arg | Val | Glu | Asn | Ile | Arg | Ala | Ile | Asp | Met | Phe | Lys | Ala | | |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | | | |
| Lys | Met | Lys | Asn | Arg | Ile | Arg | Ser | Ser | Lys | Cys | Tyr | Arg | Asn | Ala | Thr | | |
| | | | 20 | | | | | 25 | | | | | 30 | | | | |
| Leu | Ile | Leu | Ile | Gly | Leu | Thr | Ala | Leu | Ser | Met | Ala | Leu | Asn | Ile | Phe | | |
| | | 35 | | | | | 40 | | | | | 45 | | | | | |
| Leu | Ile | Ile | Asp | Tyr | Ala | Met | Leu | Lys | Asn | Met | Thr | Lys | Val | Glu | His | | |
| | 50 | | | | | 55 | | | | | 60 | | | | | | |
| Cys | Val | Asn | Met | Pro | Pro | Val | Glu | Pro | Ser | Lys | Lys | Thr | Pro | Met | Thr | | |
| 65 | | | | | 70 | | | | | 75 | | | | 80 | | | |
| Ser | Ala | Val | Asp | Leu | Asn | Thr | Lys | Leu | Asn | Pro | Gln | Gln | Ala | Thr | Gln | | |
| | | | 85 | | | | | 90 | | | | | 95 | | | | |
| Leu | Thr | Thr | Glu | Asp | Ser | Thr | Ser | Leu | Ala | Ala | Thr | Ser | Glu | Asp | His | | |
| | | | 100 | | | | | 105 | | | | | 110 | | | | |
| Leu | Leu | Thr | Gly | Thr | Thr | Pro | Thr | Pro | Asp | Ala | Thr | Val | Ser | Gln | Gln | | |
| | | 115 | | | | | 120 | | | | | 125 | | | | | |
| Thr | Thr | Asp | Glu | His | Thr | Thr | Leu | Leu | Arg | Ser | Thr | Asn | Arg | Gln | Thr | | |
| | 130 | | | | | 135 | | | | | 140 | | | | | | |
| Thr | Gln | Thr | Thr | Thr | Glu | Lys | Lys | Pro | Thr | Gly | Ala | Thr | Thr | Lys | Lys | | |
| 145 | | | | | 150 | | | | | 155 | | | | 160 | | | |
| Glu | Thr | Thr | Thr | Arg | Thr | Thr | Ser | Thr | Ala | Ala | Thr | Gln | Thr | Leu | Asn | | |
| | | | 165 | | | | | 170 | | | | | 175 | | | | |
| Thr | Thr | Asn | Gln | Thr | Ser | Asn | Gly | Arg | Glu | Ala | Thr | Thr | Thr | Ser | Thr | | |
| | | 180 | | | | | | 185 | | | | | 190 | | | | |
| Arg | Ser | Arg | Asn | Gly | Ala | Thr | Thr | Gln | Asn | Ser | Asp | Gln | Thr | Thr | Xaa | | |
| | | 195 | | | | | 200 | | | | | 205 | | | | | |
| Thr | Ala | Asp | Pro | Ser | Ser | Gln | Pro | His | His | Thr | Gln | Lys | Ser | Thr | Thr | | |
| | 210 | | | | | 215 | | | | | 220 | | | | | | |
| Thr | Thr | Tyr | Asn | Thr | Asp | Thr | Ser | Ser | Pro | Ser | Ser | | | | | | |
| 225 | | | | | 230 | | | | | 235 | | | | | | | |

<210> 149
 <211> 236
 <212> PRT
 <213> human metapneumo virus

| | | | | | | | | | | | | | | | | | |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| <400> 149 | | | | | | | | | | | | | | | | | |
| Met | Glu | Val | Arg | Val | Glu | Asn | Ile | Arg | Ala | Ile | Asp | Met | Phe | Lys | Ala | | |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Lys | Met | Lys | Asn | Arg | Ile | Arg | Ser | Ser | Lys | Cys | Tyr | Arg | Asn | Ala | Thr |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Leu | Ile | Leu | Ile | Gly | Leu | Thr | Ala | Leu | Ser | Met | Ala | Leu | Asn | Ile | Phe |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Leu | Ile | Ile | Asp | Tyr | Ala | Thr | Leu | Lys | Asn | Met | Thr | Lys | Val | Glu | His |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Cys | Val | Asn | Met | Pro | Pro | Val | Glu | Pro | Ser | Lys | Lys | Thr | Pro | Met | Thr |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Ser | Ala | Val | Asp | Leu | Asn | Thr | Lys | Leu | Asn | Pro | Gln | Gln | Ala | Thr | Gln |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Leu | Thr | Thr | Glu | Asp | Ser | Thr | Ser | Leu | Ala | Ala | Thr | Ser | Glu | Gly | His |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Pro | His | Thr | Gly | Thr | Thr | Pro | Thr | Pro | Asp | Ala | Thr | Val | Ser | Gln | Gln |
| | | 115 | | | | | 120 | | | | | | 125 | | |
| Thr | Thr | Asp | Glu | His | Thr | Thr | Leu | Leu | Arg | Ser | Thr | Asn | Arg | Gln | Thr |
| | 130 | | | | | 135 | | | | | | 140 | | | |
| Thr | Gln | Thr | Ala | Thr | Glu | Lys | Lys | Pro | Thr | Gly | Ala | Thr | Thr | Lys | Lys |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Glu | Thr | Thr | Thr | Arg | Thr | Thr | Ser | Thr | Ala | Ala | Thr | Gln | Thr | Pro | Asn |
| | | | | 165 | | | | | 170 | | | | | | 175 |
| Thr | Thr | Asn | Gln | Thr | Ser | Asn | Gly | Arg | Glu | Ala | Thr | Thr | Thr | Ser | Ala |
| | | 180 | | | | | | 185 | | | | | 190 | | |
| Arg | Ser | Arg | Asn | Gly | Ala | Thr | Thr | Gln | Asn | Ser | Asp | Gln | Ile | Thr | Gln |
| | | 195 | | | | | 200 | | | | | 205 | | | |
| Ala | Ala | Asp | Ser | Ser | Ser | Gln | Pro | His | His | Thr | Gln | Lys | Ser | Thr | Thr |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Thr | Ala | Tyr | Asn | Thr | Asp | Thr | Ser | Phe | Pro | Ser | Ser | | | | |
| 225 | | | | | 230 | | | | | 235 | | | | | |

<210> 150

<211> 236

<212> PRT

<213> human metapneumo virus

<400> 150

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Glu | Val | Arg | Val | Glu | Asn | Ile | Arg | Ala | Ile | Asp | Met | Phe | Lys | Ala |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Lys | Met | Lys | Asn | Arg | Ile | Arg | Ser | Ser | Lys | Cys | Tyr | Arg | Asn | Ala | Thr |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Leu | Ile | Leu | Ile | Gly | Leu | Thr | Ala | Leu | Ser | Met | Ala | Leu | Asn | Ile | Phe |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Leu | Ile | Ile | Asp | Tyr | Ala | Thr | Leu | Lys | Asn | Met | Thr | Lys | Val | Glu | His |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Cys | Val | Asn | Met | Pro | Pro | Val | Glu | Pro | Ser | Lys | Lys | Thr | Pro | Met | Thr |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Ser | Ala | Val | Asp | Ser | Asn | Thr | Lys | Pro | Asn | Pro | Gln | Gln | Ala | Thr | Gln |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Leu | Thr | Thr | Glu | Asp | Ser | Thr | Ser | Leu | Ala | Ala | Thr | Leu | Glu | Asp | His |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Pro | His | Thr | Gly | Thr | Thr | Pro | Thr | Pro | Asp | Ala | Thr | Val | Ser | Gln | Gln |
| | | 115 | | | | | 120 | | | | | | 125 | | |
| Thr | Thr | Asp | Glu | His | Thr | Thr | Leu | Leu | Arg | Ser | Thr | Asn | Arg | Gln | Thr |
| | 130 | | | | | 135 | | | | | | 140 | | | |
| Thr | Gln | Thr | Thr | Ala | Glu | Lys | Lys | Pro | Thr | Arg | Ala | Thr | Thr | Lys | Lys |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Glu | Thr | Thr | Thr | Arg | Thr | Thr | Ser | Thr | Ala | Ala | Thr | Gln | Thr | Leu | Asn |
| | | | | 165 | | | | | 170 | | | | | 175 | |
| Thr | Thr | Asn | Gln | Thr | Ser | Asn | Gly | Arg | Glu | Ala | Thr | Thr | Thr | Ser | Ala |
| | | 180 | | | | | | 185 | | | | | 190 | | |
| Arg | Ser | Arg | Asn | Asn | Ala | Thr | Thr | Gln | Ser | Ser | Asp | Gln | Thr | Thr | Gln |

| | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| | | 195 | | | | | 200 | | | | | 205 | | | | | |
| Ala | Ala | Glu | Pro | Ser | Ser | Gln | Ser | Gln | His | Thr | Gln | Lys | Ser | Thr | Thr | | |
| | 210 | | | | | 215 | | | | | 220 | | | | | | |
| Thr | Thr | Tyr | Asn | Thr | Asp | Thr | Ser | Ser | Leu | Ser | Ser | | | | | | |
| 225 | | | | | 230 | | | | | 235 | | | | | | | |

<210> 151
 <211> 236
 <212> PRT
 <213> human metapneumo virus

<400> 151

| | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| Met | Glu | Val | Arg | Val | Glu | Asn | Ile | Arg | Ala | Ile | Asp | Met | Phe | Lys | Ala | | |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | | | |
| Lys | Met | Lys | Asn | Arg | Ile | Arg | Ser | Ser | Lys | Cys | Tyr | Arg | Asn | Ala | Thr | | |
| | | | 20 | | | | | 25 | | | | | 30 | | | | |
| Leu | Ile | Leu | Ile | Gly | Leu | Ser | Ala | Leu | Ser | Met | Ala | Leu | Asn | Ile | Phe | | |
| | | 35 | | | | | 40 | | | | | 45 | | | | | |
| Leu | Ile | Ile | Asp | Tyr | Ala | Lys | Ser | Lys | Asn | Met | Thr | Arg | Val | Glu | His | | |
| | 50 | | | | | 55 | | | | | 60 | | | | | | |
| Cys | Val | Asn | Met | Pro | Pro | Val | Glu | Pro | Ser | Lys | Lys | Thr | Pro | Met | Thr | | |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 | | |
| Ser | Ala | Val | Asp | Leu | Asn | Thr | Lys | Pro | Asn | Pro | Gln | Arg | Ala | Thr | Gln | | |
| | | | 85 | | | | | 90 | | | | | | 95 | | | |
| Leu | Thr | Thr | Glu | Asp | Ser | Thr | Ser | Leu | Ala | Ala | Thr | Leu | Glu | Gly | His | | |
| | | | 100 | | | | | 105 | | | | | 110 | | | | |
| Leu | His | Thr | Gly | Thr | Thr | Pro | Thr | Pro | Asp | Val | Thr | Val | Ser | Gln | Gln | | |
| | 115 | | | | | | 120 | | | | | 125 | | | | | |
| Thr | Thr | Asp | Glu | His | Thr | Thr | Leu | Leu | Arg | Ser | Thr | Asn | Arg | Gln | Thr | | |
| | 130 | | | | | | 135 | | | | | 140 | | | | | |
| Thr | Gln | Thr | Ala | Ala | Glu | Lys | Lys | Pro | Thr | Arg | Val | Thr | Thr | Asn | Lys | | |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 | | |
| Glu | Thr | Ile | Thr | Arg | Thr | Thr | Ser | Thr | Ala | Ala | Thr | Gln | Thr | Leu | Asn | | |
| | | | 165 | | | | | 170 | | | | | | 175 | | | |
| Thr | Thr | Asn | Gln | Thr | Asn | Asn | Gly | Arg | Glu | Ala | Thr | Thr | Thr | Ser | Ala | | |
| | | 180 | | | | | | 185 | | | | | | 190 | | | |
| Arg | Ser | Arg | Asn | Asn | Ala | Thr | Thr | Gln | Ser | Ser | Asp | Gln | Thr | Thr | Gln | | |
| | | 195 | | | | | 200 | | | | | 205 | | | | | |
| Ala | Ala | Asp | Pro | Ser | Ser | Gln | Ser | Gln | His | Thr | Gln | Lys | Ser | Ile | Thr | | |
| | 210 | | | | | 215 | | | | | 220 | | | | | | |
| Thr | Thr | Tyr | Asn | Thr | Asp | Thr | Ser | Ser | Pro | Ser | Ser | | | | | | |
| 225 | | | | | 230 | | | | | 235 | | | | | | | |

<210> 152
 <211> 236
 <212> PRT
 <213> human metapneumo virus

<400> 152

| | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| Met | Glu | Val | Arg | Val | Glu | Asn | Ile | Arg | Ala | Ile | Asp | Met | Phe | Lys | Ala | | |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | | | |
| Lys | Met | Lys | Asn | Arg | Ile | Arg | Ser | Ser | Lys | Cys | Tyr | Arg | Asn | Ala | Thr | | |
| | | | 20 | | | | | 25 | | | | | 30 | | | | |
| Leu | Ile | Leu | Ile | Gly | Leu | Ser | Ala | Leu | Ser | Met | Ala | Leu | Asn | Ile | Phe | | |
| | | 35 | | | | | 40 | | | | | 45 | | | | | |
| Leu | Ile | Ile | Asp | Tyr | Ala | Lys | Ser | Lys | Thr | Met | Thr | Arg | Val | Glu | His | | |
| | 50 | | | | | 55 | | | | | 60 | | | | | | |
| Cys | Val | Asn | Met | Pro | Pro | Val | Glu | Pro | Ser | Lys | Lys | Thr | Pro | Met | Thr | | |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ser | Ala | Val | Asp | Leu | Asn | Thr | Lys | Pro | Asn | Pro | Gln | Gln | Ala | Thr | Gln |
| | | | 85 | | | | | | 90 | | | | | 95 | |
| Leu | Thr | Thr | Glu | Asp | Ser | Thr | Ser | Pro | Ala | Ala | Thr | Leu | Glu | Gly | His |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Leu | His | Thr | Gly | Thr | Thr | Pro | Thr | Pro | Asp | Ala | Thr | Val | Ser | Gln | Gln |
| | | | 115 | | | | 120 | | | | | 125 | | | |
| Thr | Thr | Asp | Glu | His | Thr | Thr | Leu | Leu | Arg | Ser | Thr | Asn | Arg | Gln | Thr |
| | | | 130 | | | 135 | | | | | 140 | | | | |
| Thr | Gln | Thr | Thr | Ala | Glu | Lys | Lys | Pro | Thr | Arg | Ala | Thr | Thr | Lys | Lys |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Glu | Thr | Ile | Thr | Arg | Thr | Thr | Ser | Thr | Ala | Ala | Thr | Gln | Thr | Leu | Asn |
| | | | | 165 | | | | | 170 | | | | | 175 | |
| Thr | Thr | Asn | Gln | Thr | Ser | Asn | Gly | Arg | Glu | Ala | Thr | Thr | Thr | Ser | Ala |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Arg | Ser | Arg | Asn | Asn | Ala | Thr | Thr | Gln | Ser | Ser | Asp | Gln | Thr | Thr | Gln |
| | | | 195 | | | | 200 | | | | | 205 | | | |
| Ala | Ala | Asp | Pro | Ser | Ser | Gln | Ser | Gln | His | Thr | Lys | Lys | Ser | Thr | Thr |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Thr | Thr | Tyr | Asn | Thr | Asp | Thr | Ser | Ser | Pro | Ser | Ser | | | | |
| 225 | | | | | 230 | | | | | 235 | | | | | |

<210> 153

<211> 236

<212> PRT

<213> human metapneumo virus

<400> 153

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Glu | Val | Arg | Val | Glu | Asn | Ile | Arg | Ala | Ile | Asp | Met | Phe | Lys | Ala |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Lys | Met | Lys | Asn | Arg | Ile | Arg | Ser | Ser | Lys | Cys | Tyr | Arg | Asn | Ala | Thr |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Leu | Ile | Leu | Ile | Gly | Leu | Thr | Ala | Leu | Ser | Met | Ala | Leu | Asn | Ile | Phe |
| | | | 35 | | | | 40 | | | | | 45 | | | |
| Leu | Ile | Ile | Asp | Tyr | Ala | Thr | Leu | Lys | Asn | Met | Thr | Lys | Val | Glu | His |
| | | | 50 | | | 55 | | | | | 60 | | | | |
| Cys | Val | Asn | Met | Pro | Pro | Val | Glu | Pro | Ser | Lys | Lys | Thr | Pro | Met | Thr |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Ser | Ala | Val | Asp | Leu | Asn | Thr | Lys | Pro | Asn | Pro | Gln | Gln | Ala | Thr | Gln |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Leu | Thr | Thr | Glu | Asp | Ser | Thr | Ser | Leu | Ala | Ala | Thr | Leu | Glu | Asp | His |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Pro | His | Thr | Gly | Thr | Thr | Pro | Thr | Pro | Asp | Ala | Thr | Val | Ser | Gln | Gln |
| | | | 115 | | | | 120 | | | | | 125 | | | |
| Thr | Thr | Asp | Glu | His | Thr | Thr | Leu | Leu | Arg | Ser | Thr | Asn | Arg | Gln | Thr |
| | | | 130 | | | 135 | | | | | 140 | | | | |
| Thr | Gln | Thr | Thr | Ala | Glu | Lys | Lys | Pro | Thr | Arg | Ala | Thr | Thr | Lys | Lys |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Glu | Thr | Thr | Thr | Arg | Thr | Thr | Ser | Thr | Ala | Ala | Thr | Gln | Thr | Leu | Asn |
| | | | | 165 | | | | | 170 | | | | | 175 | |
| Thr | Thr | Asn | Gln | Thr | Ser | Asn | Gly | Arg | Glu | Ala | Thr | Thr | Thr | Ser | Ala |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Arg | Ser | Arg | Asn | Asn | Ala | Thr | Thr | Gln | Ser | Ser | Asp | Gln | Thr | Thr | Gln |
| | | | 195 | | | | 200 | | | | | 205 | | | |
| Ala | Ala | Glu | Pro | Asn | Ser | Gln | Ser | Gln | His | Thr | Gln | Lys | Ser | Thr | Thr |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Thr | Thr | Tyr | Asn | Thr | Asp | Thr | Ser | Ser | Leu | Ser | Ser | | | | |
| 225 | | | | | 230 | | | | | 235 | | | | | |

<210> 154

<211> 449
 <212> DNA
 <213> human metapneumo virus

<400> 154
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 gacacgcctt gctggatagt aaaagcagcc ccttcttggt caggaaaaaa gggaaactat 120
 gcttgccctc taagagaaga ccaaggatgg tattgtcaaa atgcaggggc aactgtttac 180
 taccctaatg aaaaagactg tgaaacaaga ggagaccatg tcttttgcca cacagcagca 240
 ggaatcaatg ttgctgagca gtcaaaggag tgcaacataa acatatctac tactaattac 300
 ccatgcaaag ttagcacagg aagacatcct atcagtatgg ttgcactatc tcctcttggg 360
 gctttggttg cttgctacaa gggagtggagc tgttccattg gcagcaacag agtagggatc 420
 atcaagcaac tgaacaaagg ctgctctta 449

<210> 155
 <211> 449
 <212> DNA
 <213> human metapneumo virus

<400> 155
 ataggagttt acggaagctc cgtaattttac atggtgcaac tgccaatctt tgggggttata 60
 gacacgcctt gctggatagt aaaagcagcc ccttcttggt cagaaaaaaa gggaaactat 120
 gcttgccctc taagagaaga tcaaggatgg tattgtcaga atgcaggggc aactgtttac 180
 taccctaatg aaaaagactg cgaaacaaga ggagaccatg tcttttgcca cacagcagca 240
 ggaatcaatg ttgctgagca gtcaaaggag tgcaacatca acatatccac tactaattac 300
 ccatgcaaag ttagcacagg aagacatcct atcagtatgg ttgcactgtc tcctcttggg 360
 gctttggttg cttgctacaa gggagtggagc tgttccattg gcagcaacag agtagggatc 420
 atcaagcaac tgaacaaagg ctgctctta 449

<210> 156
 <211> 449
 <212> DNA
 <213> human metapneumo virus

<400> 156
 ataggagttt acggaagctc cgtaattttac atggtgcaac tgccaatctt tgggggttata 60
 gacacgcctt gctggatagt aaaagcagcc ccttcttggt cagaaaaaaa gggaaactat 120
 gcttgccctc taagagaaga tcaaggatgg tattgtcaga atgcaggggc aactgtttac 180
 taccctaatg aaaaagattg cgaaacaaga ggagaccatg tcttttgcca cacagcagca 240
 ggaatcaatg ttgctgagca gtcaaaggag tgcaacatca acatatccac tactaattac 300
 ccatgcaaag ttagcacagg aagacatcct atcagtatgg ttgcactgtc tcctcttggg 360
 gctttggttg cttgctacaa gggagtggagc tgttccattg gcagcaacag agtagggatc 420
 atcaagcaac tgaacaaagg ctgctctta 449

<210> 157
 <211> 449
 <212> DNA
 <213> human metapneumo virus

<400> 157
 ataggagttt acggaagctc cgtaattttac atggtgcaac tgccaatctt tgggggttata 60
 gacacgcctt gctggatagt aaaagcagcc ccttcttggt cagaaaaaaa gggaaactat 120
 gcttgccctc taagagaaga tcaaggatgg tattgtcaga atgcaggggc aactgtttac 180
 taccctaatg aaaaagactg cgaaacaaga ggagaccatg tcttttgcca cacagcagca 240
 ggaatcaatg ttgctgagca gtcaaaggag tgcaacatca acatatccac tactaattac 300
 ccatgcaaag ttagcacagg aagacatcct atcagtatgg ttgcactgtc tcctcttggg 360
 gctttggttg cttgctacaa gggagtggagc tgttccattg gcagcaacag agtagggatc 420
 atcaagcaac tgaacaaagg ctgctctta 449

<210> 158
 <211> 449

<212> DNA

<213> human metapneumo virus

<400> 158

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ataggagttt acggaagctc cgtaatttac atggtgcaac tgccaatctt tggggttata 60
gacacgcctt gctggatagt aaaagcagcc ccttcttgct cagaaaaaaa gggaaactat 120
gcttgccctt taagagaaga tcaaggatgg tattgtcaga atgcaggggc aactgtttac 180
taccctaatg aaaaagattg cgaaacaaga ggagaccatg tcttttgcca cacagcagca 240
ggaatcaatg ttgctgagca gtcaaaggag tgcaacatca acatatccac tactaattac 300
ccatgcaaag ttagcacagg aagacatcct atcagtatgg ttgcaactgtc tctcttggg 360
gctttggttg cttgctacaa gggagtgggc tgttccattg gtagcaacag agtagggatc 420
atcaagcaac tgaacaaagg ctgctctta 449
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<210> 159

<211> 449

<212> DNA

<213> human metapneumo virus

<400> 159

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ataggagttt acggaagctc cgtaatttac atggtgcaac tgccaatctt tggggttata 60
gacacgcctt gctggatagt aaaagcagcc ccttcttgct cagaaaaaaa gggaaactat 120
gcttgccctt taagagaaga ccaaggatgg tattgtcaga atgcaggggc aactgtttac 180
taccctaatg aaaaagactg tgaacaaga ggagaccatg tcttttgcca cacagcagca 240
ggaatcaatg ttgctgagca gtcaaaggag tgcaacataa acatatctac tactaattac 300
ccatgcaaag ttagcacagg aagacatcct atcagtatgg ttgcaactgtc tctcttggg 360
gctttggttg cttgctacaa gggagtgggc tgttccattg gcagcaacag agtagggatc 420
atcaagcaac tgaacaaagg ctgctctta 449
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<210> 160

<211> 449

<212> DNA

<213> human metapneumo virus

<400> 160

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gacacgcctt gctggatagt aaaagcagcc ccttcttgct cagaaaaaaa gggaaactat 120
gcttgccctt taagagaaga ccaaggatgg tattgtcaga atgcaggggc aactgtttac 180
taccctaatg aaaaagactg tgaacaaga ggagaccatg tcttttgcca cacagcagca 240
ggaatcaatg ttgctgagca gtcaaaggag tgcaacataa acatatctac tactaattac 300
ccatgcaaag ttagcacagg aagacatcct atcagtatgg ttgcaactgtc tctcttggg 360
gctttggttg cttgctacaa gggagtgggc tgttccattg gcagcaacag agtagggatc 420
atcaagcaac tgaacaaagg ctgctctta 449
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<210> 161

<211> 449

<212> DNA

<213> human metapneumo virus

<400> 161

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ataggagttt acggaagctc cgtaatttac atggtgcaac tgccaatctt tggggttata 60
gacacgcctt gctggatagt aaaagcagcc ccttcttgct cagaaaaaaa gggaaactat 120
gcttgccctt taagagaaga ccaaggatgg tattgtcaga atgcaggggc aactgtttac 180
taccctaatg aaaaagactg tgaacaaga ggagaccatg tcttttgcca cacagcagca 240
ggaatcaatg ttgctgagca gtcaaaggag tgcaacataa acatatctac tactaattac 300
ccatgcaaag ttagcacagg aagacatcct atcagtatgg ttgcaactgtc tctcttggg 360
gctttggttg cttgctacaa gggagtgggc tgttccattg gcagcaacag agtagggatc 420
atcaagcaac tgaacaaagg ctgctctta 449
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<210> 162

<211> 449

<212> DNA

<213> human metapneumo virus

<400> 162

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ataggagttt acggaagctc cgtaattttac atggtgcaac tgccaatctt tggggttata 60
gacacgcctt gctggatagt aaaagcagcc ccttcttgct cagaaaaaaaaa gggaaactat 120
gcttgccctt taagagaaga tcagggatgg tattgtcaga atgcagggtc aactgtttac 180
taccctaaatg aaaaagactg tgaacaaga ggagaccatg tcttttgca cacagcagca 240
ggaatcaatg ttgctgagca gtcaaaggag tgcaacatca acatatccac tactaattac 300
ccatgcaaag ttagcacagg aagacatcct atcagtatgg ttgcaactgtc tcctcttggg 360
gctttggttg cttgctacaa gggagtgage tgttccattg gcagcaacag agtaggaatc 420
atcaagcaac tgaacaaagg ctgctctta 449
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<210> 163

<211> 449

<212> DNA

<213> human metapneumo virus

<400> 163

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ataggagttt acggaagctc cgtaattttac atggtgcaac tgccaatctt tggagttata 60
gacacgcctt gctggatagt aaaagcagcc ccttcttgct cagaaaaaaaaa gggaaactat 120
gcttgccctt taagagaaga tcaaggatgg tattgtcaga atgcagggtc aactgtttac 180
taccctaaatg aaaaagactg cgaacaaga ggagaccatg tcttttgca cacagcagca 240
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<211> 449

<212> DNA

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<400> 164

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<400> 174


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<210> 175

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<210> 178

<211> 449

<212> DNA

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<400> 178

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<211> 449

<212> DNA

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<210> 182

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<213> human metapneumo virus

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<210> 183

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<212> DNA

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<210> 185

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<210> 186

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<213> human metapneumo virus

<400> 186

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gctctggttg cttgttaciaa aggagtaagc tgttctattg gcagcaatag agtagggatc 420
atcaagcagc tgaacaaagg ttgctccta 449
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<210> 190

<211> 449

<212> DNA

<213> human metapneumo virus

<400> 190

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gacacgccct gctggatagt aaaagcagcc ccttcttgtt ccgaaaaaaa gggaaactat 120
gcttgccctc taagagaaga ccaagggtgg tattgtcaga atgcagggtc aactgtttac 180
tacccaaatg agaagactg tgaacaaga ggagaccatg tcttttgcga cacagcagca 240
```

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ggaattaatg ttgctgagca atcaaaggag tgcaacatca acatatccac tacaaattac 300
ccatgcaaag tcagcacagg aagacatcct atcagtatgg ttgactgtc tcctcttggg 360
gctctggttg cttgctacaa aggagtaagc tgttccattg gcagcaacag agtagggatc 420
atcaagcagc tgaacaaagg ttgctccta 449

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<210> 191
<211> 449
<212> DNA
<213> human metapneumo virus

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<400> 191
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gacacgcctt gctggatagt aaaagcagcc ccttcttggt ccgaaaaaaa gggaaactat 120
gcttgccctt taagagaaga ccaagggtgg tattgtcaga atgcagggtc aactgtttac 180
taccctaatg agaaagactg tgaaacaaga ggagaccatg tcttttgcca cacagcagca 240
ggaattaatg ttgctgagca atcaaaggag tgcaacatca acatatccac tacaaattac 300
ccatgcaaag tcagcacagg aagacatcct atcagtatgg ttgactgtc tcctcttggg 360
gctctggttg cttgctacaa aggagtaagc tgttccattg gcagcaacag agtagggatc 420
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<210> 192
<211> 449
<212> DNA
<213> human metapneumo virus

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<400> 192
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gcttgccctt taagagaaga ccaaggatgg tattgtcaga atgcagggtc aactgtttac 180
taccctaatg agaaagactg tgaaacaaga ggagaccatg tcttttgcca cacagcagca 240
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ccatgcaaag tcagcacagg aaggcatcct atcagtatgg ttgactgtc cctctcggg 360
gctctggttg cctgttataa aggagtaagt tgttccattg gcagcaatag agtagggatc 420
atcaagcagc tgaacaaagg ttgctccta 449

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<210> 193
<211> 449
<212> DNA
<213> human metapneumo virus

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<400> 193
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gcttgccctt taagagaaga ccaagggtgg tattgtcaga atgcagggtc aactgtttac 180
taccctaatg agaaagactg tgaaacaaga ggagaccatg tcttttgcca cacagcagca 240
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ccatgcaaag tcagcacagg aagacatcct atcagtatgg ttgactgtc tcctcttggg 360
gctctggttg cttgctacaa aggagtaagc tgttccattg gcagcaacag agtagggatc 420
ataaagcagc tgaacaaagg ttgctccta 449

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<210> 194
<211> 449
<212> DNA
<213> human metapneumo virus

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<400> 194
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gacacgcctt gctggatagt aaaagcagcc ccttcttggt ccgaaaaaaa gggaaactat 120
gcttgccctt taagagaaga ccaaggatgg tattgtcaga atgcagggtc aactgtttac 180
taccctaatg agaaagactg tgaaacaaga ggagaccatg tcttttgcca cacagcagca 240
ggaattaatg ttgctgagca atcaaaggag tgcaacatca acatatccac cacaattac 300

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ccatgcaaag tcagcacagg aaggcatcct atcagtatgg ttgcaactgtc ccctctcggg 360
gctctggttg cctgttataa aggagtaagt tgttccattg gcagcaatag agtagggatc 420
atcaagcagc tgaacaaagg ttgctccta 449
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<210> 195

<211> 449

<212> DNA

<213> human metapneumo virus

<400> 195

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gcttgccctc taagagaaga ccaagggtgg tattgtcaga atgcagggtc aactgtttac 180
taccctaatg agaaagactg tgaacaaga ggagaccatg tcttttgcca cacagcagca 240
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atcaagcagc tgaacaaagg ttgctccta 449
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<210> 196

<211> 449

<212> DNA

<213> human metapneumo virus

<400> 196

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gcttgccctc taagagaaga ccaaggatgg tattgtcaga atgcagggtc aactgtttac 180
taccctaatg agaaagactg tgaacaaga ggagaccatg tcttttgcca cacagcagca 240
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atcaagcagc tgaacaaagg ttgctccta 449
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<210> 197

<211> 449

<212> DNA

<213> human metapneumo virus

<400> 197

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gcttgccctc taagagaaga ccaagggtgg tattgtcaga atgcagggtc aactgtttac 180
taccctaatg agaaagactg tgaacaaga ggagaccatg tcttttgcca cacagcagca 240
ggaattaatg ttgctgagca atcaaaggag tgcaacatca acatatccac tacaattac 300
ccatgcaaag tcagcacagg aagacatcct atcagtatgg ttgcaactgtc tcctcttggg 360
gctctggttg cttgctataa aggagtaagc tgttccattg gcagcaacag agtagggatc 420
ataaagcagc tgaacaaagg ttgctccta 449
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<210> 198

<211> 449

<212> DNA

<213> human metapneumo virus

<400> 198

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gcttgccctc taagagagga tcaagggtgg tattgtataa atgcaggatc cactgtttac 180
taccctaatg aaaaagactg cgaacaaga ggtgatcatg ttttttgtga cacagcagca 240
gggatcaatg ttgctgagca atcaagagaa tgcaacatca acatatctac taccaactac 300
ccatgcaaag tcagcacagg aagacaccct ataagcatgg ttgcaactatc acctctcggg 360
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gctttggtgg cttgctataa aggggtaagc tgctcgattg gcagcaatcg ggttgaatc 420
atcaacaat tacctaaagg ctgctcata 449

<210> 199

<211> 449

<212> DNA

<213> human metapneumo virus

<400> 199

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gcttgccctcc taagagagga tcaaggggtgg tattgtaaaa atgcaggatc tactgtttac 180
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ccatgcaaag tcagcacagg aagacaccct ataagcatgg ttgcactatc acctctcggg 360
gctttggtgg cttgctataa aggggtaagc tgctcgattg gcagcaattg ggttgaatc 420
atcaacaat taccctaaagg ctgctcata 449

<210> 200

<211> 449

<212> DNA

<213> human metapneumo virus

<400> 200

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ccatgcaaag tcagcacagg aagacaccct ataagcatgg ttgcactatc acctctcggg 360
gctttggtgg cttgctataa aggggtaagc tgctcgattg gcagcaatcg ggttgaatc 420
atcaacaat taccctaaagg ctgctcata 449

<210> 201

<211> 449

<212> DNA

<213> human metapneumo virus

<400> 201

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gatacacctt gttggatcat caaggcagct ccctcttgct cagaaaaaaaa cggaattat 120
gcttgccctcc taagagagga tcaaggggtgg tattgtaaaa atgcaggatc tactgtttac 180
taccctaatg aaaaagactg cgaaacaaga ggtgatcatg ttttttgtga cacagcagca 240
gggatcaatg ttgctgagca atcaagagaa tgcaacatca acatatctac taccaactac 300
ccatgcaaag tcagcacagg aagacaccct ataagcatgg ttgcactatc acctctcggg 360
gctttggtgg cttgctataa aggggtaagc tgctcgattg gcagcaatcg ggttgaatc 420
atcaacaat taccctaaagg ctgctcata 449

<210> 202

<211> 449

<212> DNA

<213> human metapneumo virus

<400> 202

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gatacacctt gttggataat caaggcagct ccctcttgct cagaaaaaaaa cggaattat 120
gcttgccctcc taagagagga tcaaggggtgg tattgcaaaa atgcaggatc cactgtttac 180
taccctaatg aaaaagactg cgaaacaaga ggtgatcatg ttttttgtga cacagcagca 240
gggatcaatg ttgctgagca atcaagagaa tgcaacatca acatatctac taccaactac 300
ccatgcaaag tcagcacagg aagacaccct ataagcatgg ttgcactatc acctctcggg 360
gctttggtgg cttgctataa aggggtaagc tgctcgattg gcagcaatcg ggttgaatc 420

atcaaacaat tacctaaagg ctgctcata

449

<210> 203

<211> 449

<212> DNA

<213> human metapneumo virus

<400> 203

| | | | | | | |
|------------|------------|------------|------------|-------------|-------------|-----|
| ataggggtct | acggaagctc | cgtgatttac | atggttcaat | tgccgatctt | tggtgtcata | 60 |
| gatacacctt | gttggataat | caaggcagct | ccctcttgct | cagaaaaaaaa | cggaattat | 120 |
| gcttgctcc | taagagagga | tcaaggttg | tattgtaaaa | atgcaggatc | caactgtttac | 180 |
| tacccaaatg | aaaaagactg | cgaaacaaga | ggtgatcatg | ttttttgtga | cacagcagca | 240 |
| gggatcaatg | ttgctgagca | atcaagagaa | tgcaacatca | acatatctac | taccaactac | 300 |
| ccatgcaaag | tcagcacagg | aagacaccct | ataagcatgg | ttgcactatc | acctctcggg | 360 |
| gctttggtgg | cttgctataa | aggggtaagc | tgctcgattg | gcagcaatcg | ggttggaatc | 420 |
| atcaaacaat | tacctaaagg | ctgctcata | | | | 449 |

<210> 204

<211> 449

<212> DNA

<213> human metapneumo virus

<400> 204

| | | | | | | |
|------------|------------|------------|------------|-------------|-------------|-----|
| ataggggtct | acggaagctc | tgtaatttac | atggttcaat | tgccgatctt | tggtgtcata | 60 |
| gatacacctt | gttggataat | caaggcagct | ccctcttgct | cagaaaaaaaa | cggaattat | 120 |
| gcttgctcc | taagagagga | tcaaggttg | tattgtaaaa | atgcaggatc | caactgtttac | 180 |
| tacccaaatg | aaaaagactg | cgaaacaaga | ggtgatcatg | ttttttgtga | cacagcagca | 240 |
| gggatcaatg | ttgctgagca | atcaagagaa | tgcaacatca | acatatctac | taccaactac | 300 |
| ccatgcaaag | tcagcacagg | aagacaccct | ataagcatgg | ttgcactatc | acctctcggg | 360 |
| gctttggtgg | cttgctataa | aggggtaagc | tgctcgattg | gcagcaatcg | ggttggaatc | 420 |
| atcaaacaat | tacctaaagg | ctgctcata | | | | 449 |

<210> 205

<211> 449

<212> DNA

<213> human metapneumo virus

<400> 205

| | | | | | | |
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| ataggggtct | acggaagctc | cgtgatttac | atggttcaat | tgccgatctt | tggtgtcata | 60 |
| gatacacctt | gttggataat | caaggcagct | ccctcttgct | cagaaaaaaaa | cggaattat | 120 |
| gcttgctcc | taagagagga | tcaaggttg | tattgtaaaa | atgcaggatc | caactgtttac | 180 |
| tacccaaatg | aaaaagactg | cgaaacaaga | ggtgatcatg | ttttttgtga | cacagcagca | 240 |
| gggatcaatg | ttgctgagca | atcaagagaa | tgcaacatca | acatatctac | taccaactac | 300 |
| ccatgcaaag | tcagcacagg | aagacactct | ataagcatgg | ttgcactatc | acctctcggg | 360 |
| gctttggtgg | cttgctataa | aggggtaagc | tgctcgattg | gcagcaatcg | ggttggaatc | 420 |
| atcaaacaat | tacctaaagg | ctgctcata | | | | 449 |

<210> 206

<211> 449

<212> DNA

<213> human metapneumo virus

<400> 206

| | | | | | | |
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| ataggggtct | acggaagctc | cgtgatttac | atggttcaat | tgccgatctt | tggtgtcata | 60 |
| gatacacctt | gttggataat | caaggcagct | ccctcttgct | cagaaaaaaaa | cggaattat | 120 |
| gcttgctcc | taagagagga | tcaaggttg | tattgtaaaa | atgcaggatc | caactgtttac | 180 |
| tacccaaatg | aaaaagactg | cgaaacaaga | ggtgatcatg | ttttttgtga | cacagcagca | 240 |
| gggatcaatg | ttgctgagca | atcaagagaa | tgcaacatca | acatatctac | taccaactac | 300 |
| ccatgcaaag | tcagcacagg | aagacaccct | ataagcatgg | ttgcactatc | acctctcggg | 360 |
| gctttggtgg | cttgctataa | aggggtaagc | tgctcgattg | gcagcaatcg | ggttggaatc | 420 |
| atcaaacaat | tacctaaagg | ctgctcata | | | | 449 |

<210> 207
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 <213> human metapneumo virus

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<210> 208
 <211> 449
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<210> 209
 <211> 449
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<400> 209
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<210> 210
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<400> 210
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<210> 211
 <211> 449
 <212> DNA
 <213> human metapneumo virus

<400> 211
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<210> 212
 <211> 449
 <212> DNA
 <213> human metapneumo virus

<400> 212
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<210> 213
 <211> 449
 <212> DNA
 <213> human metapneumo virus

<400> 213
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 taccctaatg aaaaagactg cgaacaaga ggtgatcatg ttttttgtga cacagcagca 240
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 atcaacaat tacctaaagg ctgctcata 449

<210> 214
 <211> 449
 <212> DNA
 <213> human metapneumo virus

<400> 214
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 gcttgctctc taagagagga tcaaggggtgg tattgtaaaa atgcaggatc cactgtttac 180
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 atcaacaat tacctaaagg ctgctcata 449

<210> 215

<211> 449
 <212> DNA
 <213> human metapneumo virus

<400> 215
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 gcttgctcc taagagagga tcaagggtgg tattgtaaaa atgcaggatc cactgtttac 180
 taccctaatg aaaaagactg cgaacaaga ggtgatcatg ttttttgtga tacagcagca 240
 gggatcaatg ttgctgagca atcaagagaa tgcaacatca acatatctac taccaactac 300
 ccatgcaaag tcagcacagg aagacaccct ataagcatgg ttgcactatc acctctcgg 360
 gctttggtgg cttgctataa aggggtaagc tgctcgattg gcagcaatcg ggttggaatc 420
 atcaaacaat taccctaaag ctgctcata 449

<210> 216
 <211> 449
 <212> DNA
 <213> human metapneumo virus

<400> 216
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 gcttgctcc taagagagga tcaagggtgg tactgtaaaa atgcaggatc cactgtttac 180
 taccctaatg aaaaagactg cgaacaaga ggtgatcatg ttttttgtga cacagcagca 240
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 ccatgcaaag tcagcacagg aagacaccct ataagcatgg ttgcactatc acctctcgg 360
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 atcaaacaat tacctaaagg ctgctcata 449

<210> 217
 <211> 449
 <212> DNA
 <213> human metapneumo virus

<400> 217
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 gcttgctcc taagagagga tcaagggtgg tattgcaaaa atgcaggatc cactgtttac 180
 taccctaatg aaaaagactg cgaacaaga ggtgatcatg ttttttgtga cacagcagca 240
 gggatcaatg ttgctgagca atcaagagaa tgcaacatca acatatctac caccaactac 300
 ccatgcaaag tcagcacagg aagacaccct atcagcatgg ttgcactatc acctctcgg 360
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 atcaaacaac tacctaaagg ctgctcata 449

<210> 218
 <211> 449
 <212> DNA
 <213> human metapneumo virus

<400> 218
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 gcttgctcc taagagagga tcaagggtgg tattgtaaaa atgcaggatc cactgtttac 180
 taccctaatg aaaaagactg cgaacaaga ggtgatcatg ttttttgtga cacagcagca 240
 gggatcaatg ttgctgagca atcaagagaa tgcaacatca acatatctac caccaactac 300
 ccatgcaaag tcagcacagg aagacacccc atcagcatgg ttgcactatc acctctcgg 360
 gctttggtag cttgctacaa aggggttagc tgctcgattg gcagtaatcg ggttggaata 420
 atcaaacaac tacctaaagg ctgctcata 449

<210> 219
 <211> 449

<212> DNA

<213> human metapneumo virus

<400> 219

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ataggggtct acggaagctc tgtgatttac atgggtccagc tgccgatctt tgggtgtcata 60
gatacacctt gttggataat caaggcagct ccctcttggt cagaaaaaga tggaaattat 120
gcttgccctc taagagagga tcaaggggtg tattgtaaaa atgcaggatc cactgtttac 180
taccctaatg aaaaagactg cgaacaaga ggtgatcatg ttttttgtga cacagcagca 240
gggatcaatg ttgctgagca atcaagagaa tgcaacatca acatatctac caccaactac 300
ccatgcaaag tcagcacagg aagacaccct atcagcatgg ttgcactatc acctctcggg 360
gctttggtag cttgctacaa aggggttagc tgctcgattg gcagtaatcg ggttgggaata 420
atcaacaac tacctaaagg ctgctcata 449
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<210> 220

<211> 449

<212> DNA

<213> human metapneumo virus

<400> 220

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ataggggtct acggaagctc cgtgatttac atgggtccagc tgccgatctt tgggtgtcata 60
gatacacctt gttggataat caaggcagct ccctcttggt cagaaaaaga tggaaattat 120
gcttgccctc taagagagga ccaaggggtg tattgtaaaa atgcgggatc cactgtttac 180
taccctaatg aaaaagactg cgaacaaga ggtgatcatg ttttttgtga cacagcagca 240
gggatcaatg ttgctgagca atcaagagaa tgcaacatca acatatctac aaccaactac 300
ccatgcaaag tcagcacagg aagacaccct atcagcatgg ttgcactatc acctctcggg 360
gctttggtag cttgctacaa aggggttagc tgttcgattg gcagtaatcg ggttgggaata 420
atcaacaac tacctaaagg ctgctcata 449
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<210> 221

<211> 449

<212> DNA

<213> human metapneumo virus

<400> 221

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ataggggtct acggaagctc cgtgatttac atgggtccagc taccgatctt tgggtgtcata 60
gatacacctt gttggataat caaggcagct ccctcttggt cagaaaaaga tggaaattat 120
gcttgccctc taagagagga tcaaggggtg tattgtaaaa atgcaggatc cactgtttac 180
taccctaatg aaaaagactg cgaacaaga ggtgatcatg ttttttgtga cacagctgca 240
gggatcaatg ttgctgagca atcaagagaa tgcaacatca acatatccac aaccaactac 300
ccatgcaaag tcagcacagg aagacaccct atcagcatgg ttgcactgtc acctctcggc 360
gctttggtag cttgctacaa aggggttagc tgttcgattg gcagtaatcg ggttgggaata 420
atcaacaac tacctaaagg ctgctcata 449
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<210> 222

<211> 449

<212> DNA

<213> human metapneumo virus

<400> 222

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ataggggtct acggaagctc cgtgatttac atgggtccagc tgccgatctt tgggtgtcata 60
gatacacctt gttggataat caaggcagct ccctcttggt cagaaaaaga tggaaattat 120
gcttgccctc taagagagga tcaaggggtg tattgtaaaa atgcaggatc cactgtttac 180
taccctaatg aaaaagactg cgaacaaga ggtgatcatg ttttttgtga cacagcagca 240
gggatcaatg ttgctgagca atcaagagaa tgcaacatca acatatctac taccaactac 300
ccatgcaaag tcagcacagg aagacaccct atcagcatgg ttgcactatc acctctcggg 360
gctttggtag cttgctacaa aggggttagc tgttcgattg gcagtaatcg ggttgggaata 420
atcaacaac tacctaaagg ctgctcata 449
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<210> 223

<211> 449

<212> DNA

<213> human metapneumo virus

<400> 223

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ataggggtct acggaagctc cgtgatttac atgggtccagc tgccgatctt tgggtgtcata 60
gatacacctt gttggataat caaggcagct cctctctgtt cagaaaaaga tggaaattat 120
gcttgccctc taagagagga tcaagggtgg tattgtaaaa atgcaggatc cactgtttac 180
tacccaaattg aaaaagactg tgaacaaga ggtgatcatg ttttttgtga cacagcagca 240
gggatcaatg ttgctgagca atcaagagaa tgcaacatca acatatctac aaccaactac 300
ccatgcaaag tcagcacagg aagacaccct atcagcatgg ttgcactatc acctctcggg 360
gctttggttag cttgctacaa aggggttagc tgttcgattg gcagtaatcg ggttgaata 420
atcaaacaac tacctaaagg ctgctcata 449
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<210> 224

<211> 449

<212> DNA

<213> human metapneumo virus

<400> 224

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ataggggtct acggaagctc cgtgatttac atgggtccagc tgccgatctt tgggtgtcata 60
gatacacctt gttggataat caaggcagct cctctctgtt cagaaaaaga tggaaattat 120
gcttgccctc taagagagga ccaagggtgg tattgtaaaa atgcgggatc cactgtttac 180
tacccaaattg aaaaagactg cgaacaaga ggtgatcatg ttttttgtga cacagcagca 240
gggatcaatg ttgctgagca atcaagagaa tgcaacatca acatatctac aaccaactac 300
ccatgcaaag tcagcacagg aagacaccct atcagcatgg ttgcactatc acctctcggg 360
gctttggttag cttgctacaa aggggttagc tgttcgattg gcagtaatcg ggttgaata 420
atcaaacaac tacctaaagg ctgctcata 449
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<210> 225

<211> 449

<212> DNA

<213> human metapneumo virus

<400> 225

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ataggggtct acggaagctc cgtgatttac atgggtccagc tgccgatctt tgggtgtcata 60
gatacacctt gttggataat caaggcagct cctctctgtt cagaaaaaga tggaaattat 120
gcttgccctc taagagagga tcaagggtgg tattgtaaaa atgcaggatc cactgtttac 180
tacccaaattg aaaaagactg cgaacaaga ggtgatcatg ttttttgtga cacagcagca 240
gggatcaatg ttgctgagca atcaagagaa tgcaacatca acatatctac aaccaactac 300
ccatgcaaag tcagcacagg aagacaccct atcagcatgg ttgcactatc acctctcggg 360
gctttggttag cttgctacaa aggggttagc tgttcgattg gcagtaatcg ggttgaata 420
atcaaacaac tacctaaagg ctgctcata 449
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<210> 226

<211> 449

<212> DNA

<213> human metapneumo virus

<400> 226

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ataggggtct acggaagctc cgtgatttac atgggtccagc tgccgatctt tgggtgtcata 60
gatacacctt gttggataat caaggcagct cctctctgtt cagaaaaaga tggaaattat 120
gcttgccctc taagagagga tcaagggtgg tattgtaaaa atgcaggatc cactgtttac 180
tacccaaattg aaaaagactg tgaacaaga ggtgatcatg ttttttgtga cacagcagca 240
gggatcaatg ttgctgagca atcaagagaa tgcaacatca acatatctac aaccaactac 300
ccatgcaaag tcagcacagg aagacaccct atcagcatgg ttgcactatc acctctcggg 360
gctttggttag cttgctacaa aggggttagc tgttcgattg gcagtaatcg ggttgaata 420
atcaaacaac tacctaaagg ctgctcata 449
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<210> 227

<211> 449

<212> DNA

<213> human metapneumo virus

<400> 227
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gatacacctt gttggataat caaggcagct ccctcttggt cagaaaaaga tggaaattat 120
gcttgccctc taagagagga tcaagggtgg tattgtaaaa atgcaggatc cactgtttac 180
taccctaatg aaaaagactg cgaaacaaga ggtgatcatg ttttttgtga cacagctgca 240
gggatcaatg ttgctgagca atcaagagaa tgcaacatca acatatctac aaccaactac 300
ccatgcaaag tcagcacagg aagacaccct atcagcatgg ttgcactatc acctctcggg 360
gctttggtag cttgctacaa aggggttagc tgttcaattg gcagtaatcg ggttgaata 420
atcaaacaac tacctaaagg ctgctcata 449

<210> 228

<211> 449

<212> DNA

<213> human metapneumo virus

<400> 228
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gatacacctt gttggataat caaggcagct ccctcttggt cagaaaaaga tggaaattat 120
gcttgccctc taagagagga tcaagggtgg tattgtaaaa atgcaggatc cactgtttac 180
taccctaatg aaaaagactg cgaaacaaga ggtgatcatg ttttttgtga cacagctgca 240
gggatcaatg ttgctgagca atcaagagaa tgcaacatca acatatctac aaccaactac 300
ccatgcaaag tcagcacagg aagacaccct atcagcatgg ttgcactatc acctctcggg 360
gctttggtag cttgctacaa aggggttagc tgttcaattg gcagtaatcg ggttgaata 420
atcaaacaac tacctaaagg ctgctcata 449

<210> 229

<211> 449

<212> DNA

<213> human metapneumo virus

<400> 229
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gcttgccctc taagagagga tcaagggtgg tattgtaaaa atgcaggatc cactgtttac 180
taccctaatg aaaaagactg cgaaacaaga ggtgatcatg ttttttgtga cacagctgca 240
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ccatgcaaag tcagcacagg aagacaccct atcagcatgg ttgcactatc acctctcggg 360
gctttggtag cttgctacaa ggggttagc tgttcgattg gcagtaatcg ggttgaata 420
atcaaacaac tacctaaagg ctgctcata 449

<210> 230

<211> 449

<212> DNA

<213> human metapneumo virus

<400> 230
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gatacacctt gttggataat caaggcagct ccctcttggt cagaaaaaga tggaaattat 120
gcttgccctc taagagagga tcaagggtgg tattgtaaaa atgcaggatc cactgtttac 180
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ccatgcaaag tcagcacagg aagacaccct atcagcatgg ttgcactgtc acctctcggc 360
gctttggtag cttgctacaa aggggttagc tgttcgattg gcagtaatcg ggttgaata 420
atcaaacaac tacctaaagg ctgctcata 449

<210> 231

<211> 449

<212> DNA

<213> human metapneumo virus

<400> 231
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gatacacctt gttggataat caaggcagct ccctcttggt cagaaaaaga tggaaattat 120
gcttgccctc taagagagga tcaaggggtg tattgtaaaa atgcaggatc cactgtttac 180
taccctaatg aaaaagactg cgaaacaaga ggtgatcatg ttttttgtga cacagcagca 240
gggatcaacg ttgctgagca atcaagagaa tgcaacatca acatatctac caccaactat 300
ccgtgcaaag tcagcacagg aagacaccct atcagcatgg ttgcactatc acctctcggg 360
gctttggtag cttgctacaa aggggttagc tgctcgattg gcagtaatcg ggttgaata 420
atcaaacaac tacctaaagg ctgctcata 449

<210> 232

<211> 449

<212> DNA

<213> human metapneumo virus

<400> 232
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gatacacctt gttggataat caaggcagct ccctcttggt cagaaaaaga tggaaattat 120
gcttgccctc taagagagga tcaaggggtg tattgtaaaa atgcaggatc cactgtttac 180
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ccatgcaaag tcagcacagg aagacaccct atcagcatgg ttgcactatc acctctcggg 360
gctttggtag cttgctacaa aggggttagc tgttcaattg gcagtaatcg ggttgaata 420
atcaaacaac tacctaaagg ctgctcata 449

<210> 233

<211> 449

<212> DNA

<213> human metapneumo virus

<400> 233
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gatacacctt gttggataat caaggcagct ccctcttggt cagaaaaaga tggaaattat 120
gcttgccctc taagagagga tcaaggggtg tattgtaaaa atgcaggatc cactgtttac 180
taccctaatg aaaaagactg cgaaacaaga ggtgatcatg ttttttgtga cacagcagca 240
gggatcaatg ttgctgagca atcaagagaa tgcaacatca acatatctac aaccaactac 300
ccatgcaaag tcagcacagg aagacaccct atcagcatgg ttgcactatc acctctcggg 360
gctttggtag cttgctacaa aggggttagc tgttcgattg gcagtaatcg ggttgaata 420
atcaaacaac tacctaaagg ctgctcata 449

<210> 234

<211> 149

<212> PRT

<213> human metapneumo virus

<400> 234
Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
1 5 10 15
Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Val Lys Ala Ala Pro Ser
20 25 30
Cys Ser Gly Lys Lys Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
35 40 45
Gly Trp Tyr Cys Gln Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
50 55 60
Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
65 70 75 80
Gly Ile Asn Val Ala Glu Gln Ser Lys Glu Cys Asn Ile Asn Ile Ser
85 90 95
Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
100 105 110
Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly

115 120 125
 Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
 130 135 140
 Asn Lys Gly Cys Ser
 145

<210> 235
 <211> 149
 <212> PRT
 <213> human metapneumo virus

<400> 235
 Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1 5 10 15
 Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Val Lys Ala Ala Pro Ser
 20 25 30
 Cys Ser Glu Lys Lys Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
 35 40 45
 Gly Trp Tyr Cys Gln Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
 50 55 60
 Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
 65 70 75 80
 Gly Ile Asn Val Ala Glu Gln Ser Lys Glu Cys Asn Ile Asn Ile Ser
 85 90 95
 Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
 100 105 110
 Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
 115 120 125
 Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
 130 135 140
 Asn Lys Gly Cys Ser
 145

<210> 236
 <211> 149
 <212> PRT
 <213> human metapneumo virus

<400> 236
 Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1 5 10 15
 Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Val Lys Ala Ala Pro Ser
 20 25 30
 Cys Ser Glu Lys Lys Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
 35 40 45
 Gly Trp Tyr Cys Gln Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
 50 55 60
 Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
 65 70 75 80
 Gly Ile Asn Val Ala Glu Gln Ser Lys Glu Cys Asn Ile Asn Ile Ser
 85 90 95
 Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
 100 105 110
 Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
 115 120 125
 Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
 130 135 140
 Asn Lys Gly Cys Ser
 145

<210> 237
 <211> 149
 <212> PRT
 <213> human metapneumo virus

<400> 237
 Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1 5 10 15
 Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Val Lys Ala Ala Pro Ser
 20 25 30
 Cys Ser Glu Lys Lys Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
 35 40 45
 Gly Trp Tyr Cys Gln Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
 50 55 60
 Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
 65 70 75 80
 Gly Ile Asn Val Ala Glu Gln Ser Lys Glu Cys Asn Ile Asn Ile Ser
 85 90 95
 Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
 100 105 110
 Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
 115 120 125
 Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
 130 135 140
 Asn Lys Gly Cys Ser
 145

<210> 238
 <211> 149
 <212> PRT
 <213> human metapneumo virus

<400> 238
 Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1 5 10 15
 Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Val Lys Ala Ala Pro Ser
 20 25 30
 Cys Ser Glu Lys Lys Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
 35 40 45
 Gly Trp Tyr Cys Gln Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
 50 55 60
 Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
 65 70 75 80
 Gly Ile Asn Val Ala Glu Gln Ser Lys Glu Cys Asn Ile Asn Ile Ser
 85 90 95
 Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
 100 105 110
 Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
 115 120 125
 Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
 130 135 140
 Asn Lys Gly Cys Ser
 145

<210> 239
 <211> 149
 <212> PRT

<213> human metapneumo virus

<400> 239

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Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
1          5          10          15
Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Val Lys Ala Ala Pro Ser
20          25          30
Cys Ser Glu Lys Lys Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
35          40          45
Gly Trp Tyr Cys Gln Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
50          55          60
Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
65          70          75          80
Gly Ile Asn Val Ala Glu Gln Ser Lys Glu Cys Asn Ile Asn Ile Ser
85          90          95
Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
100          105          110
Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
115          120          125
Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
130          135          140
Asn Lys Gly Cys Ser
145
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<210> 240

<211> 149

<212> PRT

<213> human metapneumo virus

<400> 240

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Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
1          5          10          15
Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Val Lys Ala Ala Pro Ser
20          25          30
Cys Ser Glu Lys Lys Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
35          40          45
Gly Trp Tyr Cys Gln Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
50          55          60
Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
65          70          75          80
Gly Ile Asn Val Ala Glu Gln Ser Lys Glu Cys Asn Ile Asn Ile Ser
85          90          95
Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
100          105          110
Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
115          120          125
Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
130          135          140
Asn Lys Gly Cys Ser
145
```

<210> 241

<211> 149

<212> PRT

<213> human metapneumo virus

<400> 241

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Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
1          5          10          15
```

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Phe | Gly | Val | Ile | Asp | Thr | Pro | Cys | Trp | Ile | Val | Lys | Ala | Ala | Pro | Ser |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Cys | Ser | Glu | Lys | Lys | Gly | Asn | Tyr | Ala | Cys | Leu | Leu | Arg | Glu | Asp | Gln |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Gly | Trp | Tyr | Cys | Gln | Asn | Ala | Gly | Ser | Thr | Val | Tyr | Tyr | Pro | Asn | Glu |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Lys | Asp | Cys | Glu | Thr | Arg | Gly | Asp | His | Val | Phe | Cys | Asp | Thr | Ala | Ala |
| 65 | | | | | 70 | | | | | 75 | | | | 80 | |
| Gly | Ile | Asn | Val | Ala | Glu | Gln | Ser | Lys | Glu | Cys | Asn | Ile | Asn | Ile | Ser |
| | | | 85 | | | | | | 90 | | | | 95 | | |
| Thr | Thr | Asn | Tyr | Pro | Cys | Lys | Val | Ser | Thr | Gly | Arg | His | Pro | Ile | Ser |
| | | 100 | | | | | | 105 | | | | | 110 | | |
| Met | Val | Ala | Leu | Ser | Pro | Leu | Gly | Ala | Leu | Val | Ala | Cys | Tyr | Lys | Gly |
| | 115 | | | | | | 120 | | | | | 125 | | | |
| Val | Ser | Cys | Ser | Ile | Gly | Ser | Asn | Arg | Val | Gly | Ile | Ile | Lys | Gln | Leu |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Asn | Lys | Gly | Cys | Ser | | | | | | | | | | | |
| 145 | | | | | | | | | | | | | | | |

<210> 242
 <211> 149
 <212> PRT
 <213> human metapneumo virus

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ile | Gly | Val | Tyr | Gly | Ser | Ser | Val | Ile | Tyr | Met | Val | Gln | Leu | Pro | Ile |
| 1 | | | | 5 | | | | | 10 | | | | 15 | | |
| Phe | Gly | Val | Ile | Asp | Thr | Pro | Cys | Trp | Ile | Val | Lys | Ala | Ala | Pro | Ser |
| | | 20 | | | | | | 25 | | | | | 30 | | |
| Cys | Ser | Glu | Lys | Lys | Gly | Asn | Tyr | Ala | Cys | Leu | Leu | Arg | Glu | Asp | Gln |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Gly | Trp | Tyr | Cys | Gln | Asn | Ala | Gly | Ser | Thr | Val | Tyr | Tyr | Pro | Asn | Glu |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Lys | Asp | Cys | Glu | Thr | Arg | Gly | Asp | His | Val | Phe | Cys | Asp | Thr | Ala | Ala |
| 65 | | | | | 70 | | | | | 75 | | | | 80 | |
| Gly | Ile | Asn | Val | Ala | Glu | Gln | Ser | Lys | Glu | Cys | Asn | Ile | Asn | Ile | Ser |
| | | | 85 | | | | | | 90 | | | | 95 | | |
| Thr | Thr | Asn | Tyr | Pro | Cys | Lys | Val | Ser | Thr | Gly | Arg | His | Pro | Ile | Ser |
| | | 100 | | | | | | 105 | | | | | 110 | | |
| Met | Val | Ala | Leu | Ser | Pro | Leu | Gly | Ala | Leu | Val | Ala | Cys | Tyr | Lys | Gly |
| | 115 | | | | | | 120 | | | | | 125 | | | |
| Val | Ser | Cys | Ser | Ile | Gly | Ser | Asn | Arg | Val | Gly | Ile | Ile | Lys | Gln | Leu |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Asn | Lys | Gly | Cys | Ser | | | | | | | | | | | |
| 145 | | | | | | | | | | | | | | | |

<210> 243
 <211> 149
 <212> PRT
 <213> human metapneumo virus

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ile | Gly | Val | Tyr | Gly | Ser | Ser | Val | Ile | Tyr | Met | Val | Gln | Leu | Pro | Ile |
| 1 | | | | 5 | | | | | 10 | | | | 15 | | |
| Phe | Gly | Val | Ile | Asp | Thr | Pro | Cys | Trp | Ile | Val | Lys | Ala | Ala | Pro | Ser |
| | | 20 | | | | | | 25 | | | | | 30 | | |
| Cys | Ser | Glu | Lys | Lys | Gly | Asn | Tyr | Ala | Cys | Leu | Leu | Arg | Glu | Asp | Gln |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Gly | Trp | Tyr | Cys | Gln | Asn | Ala | Gly | Ser | Thr | Val | Tyr | Tyr | Pro | Asn | Glu |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 50 | | 55 | | 60 | | | | | | | | | | | |
| Lys | Asp | Cys | Glu | Thr | Arg | Gly | Asp | His | Val | Phe | Cys | Asp | Thr | Ala | Ala |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Gly | Ile | Asn | Val | Ala | Glu | Gln | Ser | Lys | Glu | Cys | Asn | Ile | Asn | Ile | Ser |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Thr | Thr | Asn | Tyr | Pro | Cys | Lys | Val | Ser | Thr | Gly | Arg | His | Pro | Ile | Ser |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Met | Val | Ala | Leu | Ser | Pro | Leu | Gly | Ala | Leu | Val | Ala | Cys | Tyr | Lys | Gly |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Val | Ser | Cys | Ser | Ile | Gly | Ser | Asn | Arg | Val | Gly | Ile | Ile | Lys | Gln | Leu |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Asn | Lys | Gly | Cys | Ser | | | | | | | | | | | |
| 145 | | | | | | | | | | | | | | | |

<210> 244
 <211> 149
 <212> PRT
 <213> human metapneumo virus

| |
|---|
| <400> 244 |
| Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile |
| 1 5 10 15 |
| Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Val Lys Ala Ala Pro Ser |
| 20 25 30 |
| Cys Ser Glu Lys Lys Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln |
| 35 40 45 |
| Gly Trp Tyr Cys Gln Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu |
| 50 55 60 |
| Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala |
| 65 70 75 80 |
| Gly Ile Asn Val Ala Glu Gln Ser Lys Glu Cys Asn Ile Asn Ile Ser |
| 85 90 95 |
| Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser |
| 100 105 110 |
| Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly |
| 115 120 125 |
| Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu |
| 130 135 140 |
| Asn Lys Gly Cys Ser |
| 145 |

<210> 245
 <211> 149
 <212> PRT
 <213> human metapneumo virus

| |
|---|
| <400> 245 |
| Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile |
| 1 5 10 15 |
| Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Val Lys Ala Ala Pro Ser |
| 20 25 30 |
| Cys Ser Glu Lys Lys Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln |
| 35 40 45 |
| Gly Trp Tyr Cys Gln Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu |
| 50 55 60 |
| Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala |
| 65 70 75 80 |
| Gly Ile Asn Val Ala Glu Gln Ser Lys Glu Cys Asn Ile Asn Ile Ser |
| 85 90 95 |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Thr | Thr | Asn | Tyr | Pro | Cys | Lys | Val | Ser | Thr | Gly | Arg | His | Pro | Ile | Ser |
| | | 100 | | | | | | 105 | | | | | 110 | | |
| Met | Val | Ala | Leu | Ser | Pro | Leu | Gly | Ala | Leu | Val | Ala | Cys | Tyr | Lys | Gly |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Val | Ser | Cys | Ser | Ile | Gly | Ser | Asn | Arg | Val | Gly | Ile | Ile | Lys | Gln | Leu |
| | | 130 | | | | 135 | | | | | 140 | | | | |
| Asn | Lys | Gly | Cys | Ser | | | | | | | | | | | |
| 145 | | | | | | | | | | | | | | | |

<210> 246
 <211> 149
 <212> PRT
 <213> human metapneumo virus

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ile | Gly | Val | Tyr | Gly | Ser | Ser | Val | Ile | Tyr | Met | Val | Gln | Leu | Pro | Ile |
| 1 | | | | 5 | | | | 10 | | | | | | 15 | |
| Phe | Gly | Val | Ile | Asp | Thr | Pro | Cys | Trp | Ile | Val | Lys | Ala | Ala | Pro | Ser |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Cys | Ser | Glu | Lys | Lys | Gly | Asn | Tyr | Ala | Cys | Leu | Leu | Arg | Glu | Asp | Gln |
| | | 35 | | | | 40 | | | | | | 45 | | | |
| Gly | Trp | Tyr | Cys | Gln | Asn | Ala | Gly | Ser | Thr | Val | Tyr | Tyr | Pro | Asn | Glu |
| | 50 | | | | 55 | | | | | | 60 | | | | |
| Lys | Asp | Cys | Glu | Thr | Arg | Gly | Asp | His | Val | Phe | Cys | Asp | Thr | Ala | Ala |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Gly | Ile | Asn | Val | Ala | Glu | Gln | Ser | Lys | Glu | Cys | Asn | Ile | Asn | Ile | Ser |
| | | | 85 | | | | | 90 | | | | | 95 | | |
| Thr | Thr | Asn | Tyr | Pro | Cys | Lys | Val | Ser | Thr | Gly | Arg | His | Pro | Ile | Ser |
| | | 100 | | | | | | 105 | | | | | 110 | | |
| Met | Val | Ala | Leu | Ser | Pro | Leu | Gly | Ala | Leu | Val | Ala | Cys | Tyr | Lys | Gly |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Val | Ser | Cys | Ser | Ile | Gly | Ser | Asn | Arg | Val | Gly | Ile | Ile | Lys | Gln | Leu |
| | | 130 | | | | 135 | | | | | 140 | | | | |
| Asn | Lys | Gly | Cys | Ser | | | | | | | | | | | |
| 145 | | | | | | | | | | | | | | | |

<210> 247
 <211> 149
 <212> PRT
 <213> human metapneumo virus

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ile | Gly | Val | Tyr | Gly | Ser | Ser | Val | Ile | Tyr | Met | Val | Gln | Leu | Pro | Ile |
| 1 | | | | 5 | | | | 10 | | | | | | 15 | |
| Phe | Gly | Val | Ile | Asp | Thr | Pro | Cys | Trp | Ile | Val | Lys | Ala | Ala | Pro | Ser |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Cys | Ser | Glu | Lys | Lys | Gly | Asn | Tyr | Ala | Cys | Leu | Leu | Arg | Glu | Asp | Gln |
| | | 35 | | | | 40 | | | | | | 45 | | | |
| Arg | Trp | Tyr | Cys | Gln | Asn | Ala | Gly | Ser | Thr | Val | Tyr | Tyr | Pro | Asn | Glu |
| | 50 | | | | 55 | | | | | | 60 | | | | |
| Lys | Asp | Cys | Glu | Thr | Arg | Gly | Asp | His | Val | Phe | Cys | Asp | Thr | Ala | Ala |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Gly | Ile | Asn | Val | Ala | Glu | Gln | Ser | Lys | Glu | Cys | Asn | Ile | Asn | Ile | Ser |
| | | | 85 | | | | | 90 | | | | | 95 | | |
| Thr | Thr | Asn | Tyr | Pro | Cys | Lys | Val | Ser | Thr | Gly | Arg | His | Pro | Ile | Ser |
| | | 100 | | | | | | 105 | | | | | 110 | | |
| Met | Val | Ala | Leu | Ser | Pro | Leu | Gly | Ala | Leu | Val | Ala | Cys | Tyr | Lys | Gly |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Val | Ser | Cys | Ser | Ile | Gly | Ser | Asn | Arg | Val | Gly | Ile | Ile | Lys | Gln | Leu |
| | | | | | | | | | | | | | | | |

130
Asn Lys Gly Cys Ser
145

135

140

<210> 248
<211> 149
<212> PRT
<213> human metapneumo virus

<400> 248
Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
1 5 10 15
Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Val Lys Ala Ala Pro Ser
20 25 30
Cys Ser Glu Lys Lys Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
35 40 45
Gly Trp Tyr Cys Gln Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
50 55 60
Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
65 70 75 80
Gly Ile Asn Val Ala Glu Gln Ser Lys Glu Cys Asn Ile Asn Ile Ser
85 90 95
Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
100 105 110
Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
115 120 125
Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
130 135 140
Asn Lys Gly Cys Ser
145

<210> 249
<211> 149
<212> PRT
<213> human metapneumo virus

<400> 249
Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
1 5 10 15
Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Val Lys Ala Ala Pro Ser
20 25 30
Cys Ser Glu Lys Lys Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
35 40 45
Gly Trp Tyr Cys Gln Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
50 55 60
Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
65 70 75 80
Gly Ile Asn Val Ala Glu Gln Ser Lys Glu Cys Asn Ile Asn Ile Ser
85 90 95
Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
100 105 110
Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
115 120 125
Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
130 135 140
Asn Lys Gly Cys Ser
145

<210> 250
 <211> 149
 <212> PRT
 <213> human metapneumo virus

<400> 250
 Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1 5 10 15
 Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Val Lys Ala Ala Pro Ser
 20 25 30
 Cys Ser Glu Lys Lys Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
 35 40 45
 Gly Trp Tyr Cys Gln Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
 50 55 60
 Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
 65 70 75 80
 Gly Ile Asn Val Ala Glu Gln Ser Lys Glu Cys Asn Ile Asn Ile Ser
 85 90 95
 Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
 100 105 110
 Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
 115 120 125
 Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
 130 135 140
 Asn Lys Gly Cys Ser
 145

<210> 251
 <211> 149
 <212> PRT
 <213> human metapneumo virus

<400> 251
 Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1 5 10 15
 Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Val Lys Ala Ala Pro Ser
 20 25 30
 Cys Ser Glu Lys Lys Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
 35 40 45
 Gly Trp Tyr Cys Gln Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
 50 55 60
 Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
 65 70 75 80
 Gly Ile Asn Val Ala Glu Gln Ser Lys Glu Cys Asn Ile Asn Ile Ser
 85 90 95
 Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
 100 105 110
 Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
 115 120 125
 Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
 130 135 140
 Asn Lys Gly Cys Ser
 145

<210> 252
 <211> 149
 <212> PRT
 <213> human metapneumo virus

<400> 252
 Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1 5 10 15
 Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Val Lys Ala Ala Pro Ser
 20 25 30
 Cys Ser Glu Lys Lys Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
 35 40 45
 Gly Trp Tyr Cys Gln Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
 50 55 60
 Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
 65 70 75 80
 Gly Ile Asn Val Ala Glu Gln Ser Lys Glu Cys Asn Ile Asn Ile Ser
 85 90 95
 Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
 100 105 110
 Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
 115 120 125
 Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
 130 135 140
 Asn Lys Gly Cys Ser
 145

<210> 253
 <211> 149
 <212> PRT
 <213> human metapneumo virus

<400> 253
 Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1 5 10 15
 Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Val Lys Ala Ala Pro Ser
 20 25 30
 Cys Ser Glu Lys Lys Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
 35 40 45
 Gly Trp Tyr Cys Gln Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
 50 55 60
 Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
 65 70 75 80
 Gly Ile Asn Val Ala Glu Gln Ser Lys Glu Cys Asn Ile Asn Ile Ser
 85 90 95
 Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
 100 105 110
 Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
 115 120 125
 Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
 130 135 140
 Asn Lys Gly Cys Ser
 145

<210> 254
 <211> 149
 <212> PRT
 <213> human metapneumo virus

<400> 254
 Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1 5 10 15
 Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Val Lys Ala Ala Pro Ser
 20 25 30

Cys Ser Gly Lys Lys Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
 35 40 45
 Gly Trp Tyr Cys Gln Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
 50 55 60
 Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
 65 70 75 80
 Gly Ile Asn Val Ala Glu Gln Ser Lys Glu Cys Asn Ile Asn Ile Ser
 85 90 95
 Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
 100 105 110
 Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
 115 120 125
 Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
 130 135 140
 Asn Lys Gly Cys Ser
 145

<210> 255

<211> 149

<212> PRT

<213> human metapneumo virus

<400> 255

Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1 5 10 15
 Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Val Lys Ala Ala Pro Ser
 20 25 30
 Cys Ser Gly Lys Lys Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
 35 40 45
 Gly Trp Tyr Cys Gln Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
 50 55 60
 Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
 65 70 75 80
 Gly Ile Asn Val Ala Glu Gln Ser Lys Glu Cys Asn Ile Asn Ile Ser
 85 90 95
 Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
 100 105 110
 Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
 115 120 125
 Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
 130 135 140
 Asn Lys Gly Cys Ser
 145

<210> 256

<211> 149

<212> PRT

<213> human metapneumo virus

<400> 256

Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1 5 10 15
 Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Val Lys Ala Ala Pro Ser
 20 25 30
 Cys Ser Glu Lys Lys Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
 35 40 45
 Gly Trp Tyr Cys Gln Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
 50 55 60
 Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala

Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
115 120 125
Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
130 135 140
Asn Lys Gly Cys Ser
145

<210> 259
<211> 149
<212> PRT
<213> human metapneumo virus

<400> 259
Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
1 5 10 15
Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Val Lys Ala Ala Pro Ser
20 25 30
Cys Ser Glu Lys Lys Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
35 40 45
Gly Trp Tyr Cys Gln Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
50 55 60
Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
65 70 75 80
Gly Ile Asn Val Ala Glu Gln Ser Lys Glu Cys Asn Ile Asn Ile Ser
85 90 95
Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
100 105 110
Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
115 120 125
Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
130 135 140
Asn Lys Gly Cys Ser
145

<210> 260
<211> 149
<212> PRT
<213> human metapneumo virus

<400> 260
Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
1 5 10 15
Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Val Lys Ala Ala Pro Ser
20 25 30
Cys Ser Gly Lys Lys Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
35 40 45
Gly Trp Tyr Cys Gln Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
50 55 60
Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
65 70 75 80
Gly Ile Asn Val Ala Glu Gln Ser Lys Glu Cys Asn Ile Asn Ile Ser
85 90 95
Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
100 105 110
Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
115 120 125
Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
130 135 140
Asn Lys Gly Cys Ser

145

<210> 261
<211> 149
<212> PRT
<213> human metapneumo virus

<400> 261
Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
1 5 10 15
Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Val Lys Ala Ala Pro Ser
20 25 30
Cys Ser Glu Lys Lys Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
35 40 45
Gly Trp Tyr Cys Gln Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
50 55 60
Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
65 70 75 80
Gly Ile Asn Val Ala Glu Gln Ser Lys Glu Cys Asn Ile Asn Ile Ser
85 90 95
Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
100 105 110
Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
115 120 125
Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
130 135 140
Asn Lys Gly Cys Ser
145

<210> 262
<211> 149
<212> PRT
<213> human metapneumo virus

<400> 262
Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
1 5 10 15
Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Val Lys Ala Ala Pro Ser
20 25 30
Cys Ser Gly Lys Lys Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
35 40 45
Gly Trp Tyr Cys Gln Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
50 55 60
Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
65 70 75 80
Gly Ile Asn Val Ala Glu Gln Ser Lys Glu Cys Asn Ile Asn Ile Ser
85 90 95
Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
100 105 110
Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
115 120 125
Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
130 135 140
Asn Lys Gly Cys Ser
145

<210> 263
<211> 149

<212> PRT
 <213> human metapneumo virus

<400> 263
 Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1 5 10 15
 Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Val Lys Ala Ala Pro Ser
 20 25 30
 Cys Ser Glu Lys Lys Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
 35 40 45
 Gly Trp Tyr Cys Gln Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
 50 55 60
 Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
 65 70 75 80
 Gly Ile Asn Val Ala Glu Gln Ser Lys Glu Cys Asn Ile Asn Ile Ser
 85 90 95
 Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
 100 105 110
 Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
 115 120 125
 Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
 130 135 140
 Asn Lys Gly Cys Ser
 145

<210> 264
 <211> 149
 <212> PRT
 <213> human metapneumo virus

<400> 264
 Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1 5 10 15
 Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Val Lys Ala Ala Pro Ser
 20 25 30
 Cys Ser Glu Lys Lys Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
 35 40 45
 Gly Trp Tyr Cys Gln Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
 50 55 60
 Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
 65 70 75 80
 Gly Ile Asn Val Ala Glu Gln Ser Lys Glu Cys Asn Ile Asn Ile Ser
 85 90 95
 Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
 100 105 110
 Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
 115 120 125
 Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
 130 135 140
 Asn Lys Gly Cys Ser
 145

<210> 265
 <211> 149
 <212> PRT
 <213> human metapneumo virus

<400> 265
 Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile

| | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| 1 | | | | 5 | | | | 10 | | | | | 15 | | | | |
| Phe | Gly | Val | Ile | Asp | Thr | Pro | Cys | Trp | Ile | Val | Lys | Ala | Ala | Pro | Ser | | |
| | | | 20 | | | | | 25 | | | | | 30 | | | | |
| Cys | Ser | Glu | Lys | Lys | Gly | Asn | Tyr | Ala | Cys | Leu | Leu | Arg | Glu | Asp | Gln | | |
| | | 35 | | | | | 40 | | | | | 45 | | | | | |
| Gly | Trp | Tyr | Cys | Gln | Asn | Ala | Gly | Ser | Thr | Val | Tyr | Tyr | Pro | Asn | Glu | | |
| | 50 | | | | | 55 | | | | | 60 | | | | | | |
| Lys | Asp | Cys | Glu | Thr | Arg | Gly | Asp | His | Val | Phe | Cys | Asp | Thr | Val | Ala | | |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 | | |
| Gly | Ile | Asn | Val | Ala | Glu | Gln | Ser | Lys | Glu | Cys | Asn | Ile | Asn | Ile | Ser | | |
| | | | 85 | | | | | | 90 | | | | | 95 | | | |
| Thr | Thr | Asn | Tyr | Pro | Cys | Lys | Val | Ser | Thr | Gly | Arg | His | Pro | Ile | Ser | | |
| | | 100 | | | | | | 105 | | | | | | 110 | | | |
| Met | Val | Ala | Leu | Ser | Pro | Leu | Gly | Ala | Leu | Val | Ala | Cys | Tyr | Lys | Gly | | |
| | | 115 | | | | | 120 | | | | | 125 | | | | | |
| Val | Ser | Cys | Ser | Ile | Gly | Ser | Asn | Arg | Val | Gly | Ile | Ile | Lys | Gln | Leu | | |
| | 130 | | | | | 135 | | | | | 140 | | | | | | |
| Asn | Lys | Gly | Cys | Ser | | | | | | | | | | | | | |
| 145 | | | | | | | | | | | | | | | | | |

<210> 266
 <211> 149
 <212> PRT
 <213> human metapneumo virus

| | | | | | | | | | | | | | | | | | |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| <400> 266 | | | | | | | | | | | | | | | | | |
| Ile | Gly | Val | Tyr | Gly | Ser | Ser | Val | Ile | Tyr | Met | Val | Gln | Leu | Pro | Ile | | |
| 1 | | | | 5 | | | | 10 | | | | | 15 | | | | |
| Phe | Gly | Val | Ile | Asp | Thr | Pro | Cys | Trp | Ile | Val | Lys | Ala | Ala | Pro | Ser | | |
| | | | 20 | | | | | 25 | | | | | 30 | | | | |
| Cys | Ser | Glu | Lys | Lys | Gly | Asn | Tyr | Ala | Cys | Leu | Leu | Arg | Glu | Asp | Gln | | |
| | | 35 | | | | 40 | | | | | | 45 | | | | | |
| Gly | Trp | Tyr | Cys | Gln | Asn | Ala | Gly | Ser | Thr | Val | Tyr | Tyr | Pro | Asn | Glu | | |
| | 50 | | | | | 55 | | | | | 60 | | | | | | |
| Lys | Asp | Cys | Glu | Thr | Arg | Gly | Asp | His | Val | Phe | Cys | Asp | Thr | Ala | Ala | | |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 | | |
| Gly | Ile | Asn | Val | Ala | Glu | Gln | Ser | Lys | Glu | Cys | Asn | Ile | Asn | Ile | Ser | | |
| | | | 85 | | | | | | 90 | | | | | 95 | | | |
| Thr | Thr | Asn | Tyr | Pro | Cys | Lys | Val | Ser | Thr | Gly | Arg | His | Pro | Ile | Ser | | |
| | | 100 | | | | | | 105 | | | | | | 110 | | | |
| Met | Val | Ala | Leu | Ser | Pro | Leu | Gly | Ala | Leu | Val | Ala | Cys | Tyr | Lys | Gly | | |
| | | 115 | | | | | 120 | | | | | 125 | | | | | |
| Val | Ser | Cys | Ser | Ile | Gly | Ser | Asn | Arg | Val | Gly | Ile | Ile | Lys | Gln | Leu | | |
| | 130 | | | | | 135 | | | | | 140 | | | | | | |
| Asn | Lys | Gly | Cys | Ser | | | | | | | | | | | | | |
| 145 | | | | | | | | | | | | | | | | | |

<210> 267
 <211> 149
 <212> PRT
 <213> human metapneumo virus

| | | | | | | | | | | | | | | | | | |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| <400> 267 | | | | | | | | | | | | | | | | | |
| Ile | Gly | Val | Tyr | Gly | Ser | Ser | Val | Ile | Tyr | Met | Val | Gln | Leu | Pro | Ile | | |
| 1 | | | | 5 | | | | 10 | | | | | 15 | | | | |
| Phe | Gly | Val | Ile | Asp | Thr | Pro | Cys | Trp | Ile | Val | Lys | Ala | Ala | Pro | Ser | | |
| | | | 20 | | | | | 25 | | | | | 30 | | | | |
| Cys | Ser | Glu | Lys | Lys | Gly | Asn | Tyr | Ala | Cys | Leu | Leu | Arg | Glu | Asp | Gln | | |
| | | 35 | | | | 40 | | | | | | 45 | | | | | |

Gly Trp Tyr Cys Gln Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
 50 55 60
 Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
 65 70 75 80
 Gly Ile Asn Val Ala Glu Gln Ser Lys Glu Cys Asn Ile Asn Ile Ser
 85 90 95
 Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
 100 105 110
 Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
 115 120 125
 Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
 130 135 140
 Asn Lys Gly Cys Ser
 145

<210> 268

<211> 149

<212> PRT

<213> human metapneumo virus

<400> 268

Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1 5 10 15
 Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Val Lys Ala Ala Pro Ser
 20 25 30
 Cys Ser Glu Lys Lys Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
 35 40 45
 Gly Trp Tyr Cys Gln Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
 50 55 60
 Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
 65 70 75 80
 Gly Ile Asn Val Ala Glu Gln Ser Lys Glu Cys Asn Ile Asn Ile Ser
 85 90 95
 Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
 100 105 110
 Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
 115 120 125
 Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
 130 135 140
 Asn Lys Gly Cys Ser
 145

<210> 269

<211> 149

<212> PRT

<213> human metapneumo virus

<400> 269

Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1 5 10 15
 Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Val Lys Ala Ala Pro Ser
 20 25 30
 Cys Ser Glu Lys Lys Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
 35 40 45
 Gly Trp Tyr Cys Gln Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
 50 55 60
 Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
 65 70 75 80
 Gly Ile Asn Val Ala Glu Gln Ser Lys Glu Cys Asn Ile Asn Ile Ser

| | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| | | | | 85 | | | | | 90 | | | | | 95 | | | |
| Thr | Thr | Asn | Tyr | Pro | Cys | Lys | Val | Ser | Thr | Gly | Arg | His | Pro | Ile | Ser | | |
| | | | 100 | | | | | 105 | | | | | | 110 | | | |
| Met | Val | Ala | Leu | Ser | Pro | Leu | Gly | Ala | Leu | Val | Ala | Cys | Tyr | Lys | Gly | | |
| | | 115 | | | | | 120 | | | | | 125 | | | | | |
| Val | Ser | Cys | Ser | Ile | Gly | Ser | Asn | Arg | Val | Gly | Ile | Ile | Lys | Gln | Leu | | |
| | 130 | | | | | 135 | | | | | 140 | | | | | | |
| Asn | Lys | Gly | Cys | Ser | | | | | | | | | | | | | |
| 145 | | | | | | | | | | | | | | | | | |

<210> 270
 <211> 149
 <212> PRT
 <213> human metapneumo virus

| | | | | | | | | | | | | | | | | | |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| <400> 270 | | | | | | | | | | | | | | | | | |
| Ile | Gly | Val | Tyr | Gly | Ser | Ser | Val | Ile | Tyr | Met | Val | Gln | Leu | Pro | Ile | | |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | | | |
| Phe | Gly | Val | Ile | Asp | Thr | Pro | Cys | Trp | Ile | Val | Lys | Ala | Ala | Pro | Ser | | |
| | | | 20 | | | | | 25 | | | | | 30 | | | | |
| Cys | Ser | Glu | Lys | Lys | Gly | Asn | Tyr | Ala | Cys | Leu | Leu | Arg | Glu | Asp | Gln | | |
| | | 35 | | | | 40 | | | | | | 45 | | | | | |
| Gly | Trp | Tyr | Cys | Gln | Asn | Ala | Gly | Ser | Thr | Val | Tyr | Tyr | Pro | Asn | Glu | | |
| | 50 | | | | 55 | | | | | | 60 | | | | | | |
| Lys | Asp | Cys | Glu | Thr | Arg | Gly | Asp | His | Val | Phe | Cys | Asp | Thr | Ala | Ala | | |
| 65 | | | | | 70 | | | | | 75 | | | | 80 | | | |
| Gly | Ile | Asn | Val | Ala | Glu | Gln | Ser | Lys | Glu | Cys | Asn | Ile | Asn | Ile | Ser | | |
| | | | 85 | | | | | 90 | | | | | 95 | | | | |
| Thr | Thr | Asn | Tyr | Pro | Cys | Lys | Val | Ser | Thr | Gly | Arg | His | Pro | Ile | Ser | | |
| | | 100 | | | | | | 105 | | | | | | 110 | | | |
| Met | Val | Ala | Leu | Ser | Pro | Leu | Gly | Ala | Leu | Val | Ala | Cys | Tyr | Lys | Gly | | |
| | | 115 | | | | | 120 | | | | | 125 | | | | | |
| Val | Ser | Cys | Ser | Ile | Gly | Ser | Asn | Arg | Val | Gly | Ile | Ile | Lys | Gln | Leu | | |
| | 130 | | | | | 135 | | | | | 140 | | | | | | |
| Asn | Lys | Gly | Cys | Ser | | | | | | | | | | | | | |
| 145 | | | | | | | | | | | | | | | | | |

<210> 271
 <211> 149
 <212> PRT
 <213> human metapneumo virus

| | | | | | | | | | | | | | | | | | |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| <400> 271 | | | | | | | | | | | | | | | | | |
| Ile | Gly | Val | Tyr | Gly | Ser | Ser | Val | Ile | Tyr | Met | Val | Gln | Leu | Pro | Ile | | |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | | | |
| Phe | Gly | Val | Ile | Asp | Thr | Pro | Cys | Trp | Ile | Val | Lys | Ala | Ala | Pro | Ser | | |
| | | | 20 | | | | | 25 | | | | | 30 | | | | |
| Cys | Ser | Glu | Lys | Lys | Gly | Asn | Tyr | Ala | Cys | Leu | Leu | Arg | Glu | Asp | Gln | | |
| | | 35 | | | | 40 | | | | | | 45 | | | | | |
| Gly | Trp | Tyr | Cys | Gln | Asn | Ala | Gly | Ser | Thr | Val | Tyr | Tyr | Pro | Asn | Glu | | |
| | 50 | | | | 55 | | | | | | 60 | | | | | | |
| Lys | Asp | Cys | Glu | Thr | Arg | Gly | Asp | His | Val | Phe | Cys | Asp | Thr | Ala | Ala | | |
| 65 | | | | | 70 | | | | | 75 | | | | 80 | | | |
| Gly | Ile | Asn | Val | Ala | Glu | Gln | Ser | Lys | Glu | Cys | Asn | Ile | Asn | Ile | Ser | | |
| | | | 85 | | | | | 90 | | | | | 95 | | | | |
| Thr | Thr | Asn | Tyr | Pro | Cys | Lys | Val | Ser | Thr | Gly | Arg | His | Pro | Ile | Ser | | |
| | | 100 | | | | | | 105 | | | | | | 110 | | | |
| Met | Val | Ala | Leu | Ser | Pro | Leu | Gly | Ala | Leu | Val | Ala | Cys | Tyr | Lys | Gly | | |
| | | 115 | | | | | 120 | | | | | 125 | | | | | |

Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
 130 135 140
 Asn Lys Gly Cys Ser
 145

<210> 272
 <211> 149
 <212> PRT
 <213> human metapneumo virus

<400> 272
 Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1 5 10 15
 Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Val Lys Ala Ala Pro Ser
 20 25 30
 Cys Ser Glu Lys Lys Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
 35 40 45
 Gly Trp Tyr Cys Gln Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
 50 55 60
 Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
 65 70 75 80
 Gly Ile Asn Val Ala Glu Gln Ser Lys Glu Cys Asn Ile Asn Ile Ser
 85 90 95
 Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
 100 105 110
 Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
 115 120 125
 Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
 130 135 140
 Asn Lys Gly Cys Ser
 145

<210> 273
 <211> 149
 <212> PRT
 <213> human metapneumo virus

<400> 273
 Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1 5 10 15
 Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Val Lys Ala Ala Pro Ser
 20 25 30
 Cys Ser Glu Lys Lys Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
 35 40 45
 Gly Trp Tyr Cys Gln Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
 50 55 60
 Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
 65 70 75 80
 Gly Ile Asn Val Ala Glu Gln Ser Lys Glu Cys Asn Ile Asn Ile Ser
 85 90 95
 Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
 100 105 110
 Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
 115 120 125
 Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
 130 135 140
 Asn Lys Gly Cys Ser
 145

<210> 274
 <211> 149
 <212> PRT
 <213> human metapneumo virus

<400> 274
 Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1 5 10 15
 Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Val Lys Ala Ala Pro Ser
 20 25 30
 Cys Ser Glu Lys Lys Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
 35 40 45
 Gly Trp Tyr Cys Gln Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
 50 55 60
 Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
 65 70 75 80
 Gly Ile Asn Val Ala Glu Gln Ser Lys Glu Cys Asn Ile Asn Ile Ser
 85 90 95
 Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
 100 105 110
 Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
 115 120 125
 Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
 130 135 140
 Asn Lys Gly Cys Ser
 145

<210> 275
 <211> 149
 <212> PRT
 <213> human metapneumo virus

<400> 275
 Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1 5 10 15
 Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Val Lys Ala Ala Pro Ser
 20 25 30
 Cys Ser Glu Lys Lys Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
 35 40 45
 Gly Trp Tyr Cys Gln Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
 50 55 60
 Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
 65 70 75 80
 Gly Ile Asn Val Ala Glu Gln Ser Lys Glu Cys Asn Ile Asn Ile Ser
 85 90 95
 Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
 100 105 110
 Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
 115 120 125
 Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
 130 135 140
 Asn Lys Gly Cys Ser
 145

<210> 276
 <211> 149
 <212> PRT
 <213> human metapneumo virus

<400> 276

```
Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1          5          10          15
Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Val Lys Ala Ala Pro Ser
          20          25          30
Cys Ser Glu Lys Lys Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
          35          40          45
Gly Trp Tyr Cys Gln Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
          50          55          60
Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
65          70          75          80
Gly Ile Asn Val Ala Glu Gln Ser Lys Glu Cys Asn Ile Asn Ile Ser
          85          90          95
Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
          100          105          110
Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
          115          120          125
Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
          130          135          140
Asn Lys Gly Cys Ser
145
```

<210> 277

<211> 149

<212> PRT

<213> human metapneumo virus

<400> 277

```
Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1          5          10          15
Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Val Lys Ala Ala Pro Ser
          20          25          30
Cys Ser Glu Lys Lys Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
          35          40          45
Gly Trp Tyr Cys Gln Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
          50          55          60
Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
65          70          75          80
Gly Ile Asn Val Ala Glu Gln Ser Lys Glu Cys Asn Ile Asn Ile Ser
          85          90          95
Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
          100          105          110
Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
          115          120          125
Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
          130          135          140
Asn Lys Gly Cys Ser
145
```

<210> 278

<211> 149

<212> PRT

<213> human metapneumo virus

<400> 278

```
Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1          5          10          15
Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Ile Lys Ala Ala Pro Ser
```

| | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| | | | 20 | | | | | 25 | | | | | 30 | | | | |
| Cys | Ser | Glu | Lys | Asn | Gly | Asn | Tyr | Ala | Cys | Leu | Leu | Arg | Glu | Asp | Gln | | |
| | | 35 | | | | | 40 | | | | | 45 | | | | | |
| Gly | Trp | Tyr | Cys | Lys | Asn | Ala | Gly | Ser | Thr | Val | Tyr | Tyr | Pro | Asn | Glu | | |
| | 50 | | | | | 55 | | | | | 60 | | | | | | |
| Lys | Asp | Cys | Glu | Thr | Arg | Gly | Asp | His | Val | Phe | Cys | Asp | Thr | Ala | Ala | | |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 | | |
| Gly | Ile | Asn | Val | Ala | Glu | Gln | Ser | Arg | Glu | Cys | Asn | Ile | Asn | Ile | Ser | | |
| | | | | 85 | | | | | 90 | | | | | 95 | | | |
| Thr | Thr | Asn | Tyr | Pro | Cys | Lys | Val | Ser | Thr | Gly | Arg | His | Pro | Ile | Ser | | |
| | | 100 | | | | | | 105 | | | | | 110 | | | | |
| Met | Val | Ala | Leu | Ser | Pro | Leu | Gly | Ala | Leu | Val | Ala | Cys | Tyr | Lys | Gly | | |
| | | 115 | | | | | 120 | | | | | 125 | | | | | |
| Val | Ser | Cys | Ser | Ile | Gly | Ser | Asn | Arg | Val | Gly | Ile | Ile | Lys | Gln | Leu | | |
| | 130 | | | | | 135 | | | | | 140 | | | | | | |
| Pro | Lys | Gly | Cys | Ser | | | | | | | | | | | | | |
| 145 | | | | | | | | | | | | | | | | | |

<210> 279
 <211> 149
 <212> PRT
 <213> human metapneumo virus

| | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| | | | | | | | | | | | | | | | | | |
| Ile | Gly | Val | Tyr | Gly | Ser | Ser | Val | Ile | Tyr | Met | Val | Gln | Leu | Pro | Ile | | |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | | | |
| Phe | Gly | Val | Ile | Asp | Thr | Pro | Cys | Trp | Ile | Ile | Lys | Ala | Ala | Pro | Ser | | |
| | | 20 | | | | | | 25 | | | | | 30 | | | | |
| Cys | Ser | Glu | Lys | Asn | Gly | Asn | Tyr | Ala | Cys | Leu | Leu | Arg | Glu | Asp | Gln | | |
| | | 35 | | | | | 40 | | | | | 45 | | | | | |
| Gly | Trp | Tyr | Cys | Lys | Asn | Ala | Gly | Ser | Thr | Val | Tyr | Tyr | Pro | Asn | Glu | | |
| | 50 | | | | | 55 | | | | | 60 | | | | | | |
| Lys | Asp | Cys | Glu | Thr | Arg | Gly | Asp | His | Val | Phe | Cys | Asp | Thr | Ala | Ala | | |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 | | |
| Gly | Ile | Asn | Val | Ala | Glu | Gln | Ser | Arg | Glu | Cys | Asn | Ile | Asn | Ile | Ser | | |
| | | | | 85 | | | | | 90 | | | | | 95 | | | |
| Thr | Thr | Asn | Tyr | Pro | Cys | Lys | Val | Ser | Thr | Gly | Arg | His | Pro | Ile | Ser | | |
| | | 100 | | | | | | 105 | | | | | 110 | | | | |
| Met | Val | Ala | Leu | Ser | Pro | Leu | Gly | Ala | Leu | Val | Ala | Cys | Tyr | Lys | Gly | | |
| | | 115 | | | | | 120 | | | | | 125 | | | | | |
| Val | Ser | Cys | Ser | Ile | Gly | Ser | Asn | Trp | Val | Gly | Ile | Ile | Lys | Gln | Leu | | |
| | 130 | | | | | 135 | | | | | 140 | | | | | | |
| Pro | Lys | Gly | Cys | Ser | | | | | | | | | | | | | |
| 145 | | | | | | | | | | | | | | | | | |

<210> 280
 <211> 149
 <212> PRT
 <213> human metapneumo virus

| | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| | | | | | | | | | | | | | | | | | |
| Ile | Gly | Val | Tyr | Gly | Ser | Ser | Val | Ile | Tyr | Met | Val | Gln | Leu | Pro | Ile | | |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | | | |
| Phe | Gly | Val | Ile | Asp | Thr | Pro | Cys | Trp | Ile | Ile | Lys | Ala | Ala | Pro | Ser | | |
| | | 20 | | | | | | 25 | | | | | 30 | | | | |
| Cys | Ser | Glu | Lys | Asn | Gly | Asn | Tyr | Ala | Cys | Leu | Leu | Arg | Glu | Asp | Gln | | |
| | | 35 | | | | | 40 | | | | | 45 | | | | | |
| Gly | Trp | Tyr | Cys | Lys | Asn | Ala | Gly | Ser | Thr | Val | Tyr | Tyr | Pro | Asn | Glu | | |
| | 50 | | | | | 55 | | | | | 60 | | | | | | |

Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
 65 70 75 80
 Gly Ile Asn Val Ala Glu Gln Ser Arg Glu Cys Asn Ile Asn Ile Ser
 85 90 95
 Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
 100 105 110
 Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
 115 120 125
 Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
 130 135 140
 Pro Lys Gly Cys Ser
 145

<210> 281
 <211> 149
 <212> PRT
 <213> human metapneumo virus

<400> 281
 Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1 5 10 15
 Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Ile Lys Ala Ala Pro Ser
 20 25 30
 Cys Ser Glu Lys Asn Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
 35 40 45
 Gly Trp Tyr Cys Lys Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
 50 55 60
 Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
 65 70 75 80
 Gly Ile Asn Val Ala Glu Gln Ser Arg Glu Cys Asn Ile Asn Ile Ser
 85 90 95
 Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
 100 105 110
 Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
 115 120 125
 Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
 130 135 140
 Pro Lys Gly Cys Ser
 145

<210> 282
 <211> 149
 <212> PRT
 <213> human metapneumo virus

<400> 282
 Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1 5 10 15
 Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Ile Lys Ala Ala Pro Ser
 20 25 30
 Cys Ser Glu Lys Asn Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
 35 40 45
 Gly Trp Tyr Cys Lys Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
 50 55 60
 Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
 65 70 75 80
 Gly Ile Asn Val Ala Glu Gln Ser Arg Glu Cys Asn Ile Asn Ile Ser
 85 90 95
 Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | 100 | | | | | 105 | | | | 110 | | | | |
| Met | Val | Ala | Leu | Ser | Pro | Leu | Gly | Ala | Leu | Val | Ala | Cys | Tyr | Lys | Gly |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Val | Ser | Cys | Ser | Ile | Gly | Ser | Asn | Arg | Val | Gly | Ile | Ile | Lys | Gln | Leu |
| | | 130 | | | | | 135 | | | | | 140 | | | |
| Pro | Lys | Gly | Cys | Ser | | | | | | | | | | | |
| 145 | | | | | | | | | | | | | | | |

<210> 283
 <211> 149
 <212> PRT
 <213> human metapneumo virus

| | | | | | | | | | | | | | | | |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| <400> 283 | | | | | | | | | | | | | | | |
| Ile | Gly | Val | Tyr | Gly | Ser | Ser | Val | Ile | Tyr | Met | Val | Gln | Leu | Pro | Ile |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Phe | Gly | Val | Ile | Asp | Thr | Pro | Cys | Trp | Ile | Ile | Lys | Ala | Ala | Pro | Ser |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Cys | Ser | Glu | Lys | Asn | Gly | Asn | Tyr | Ala | Cys | Leu | Leu | Arg | Glu | Asp | Gln |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Gly | Trp | Tyr | Cys | Lys | Asn | Ala | Gly | Ser | Thr | Val | Tyr | Tyr | Pro | Asn | Glu |
| | | 50 | | | | 55 | | | | | 60 | | | | |
| Lys | Asp | Cys | Glu | Thr | Arg | Gly | Asp | His | Val | Phe | Cys | Asp | Thr | Ala | Ala |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Gly | Ile | Asn | Val | Ala | Glu | Gln | Ser | Arg | Glu | Cys | Asn | Ile | Asn | Ile | Ser |
| | | | | 85 | | | | | 90 | | | | 95 | | |
| Thr | Thr | Asn | Tyr | Pro | Cys | Lys | Val | Ser | Thr | Gly | Arg | His | Pro | Ile | Ser |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Met | Val | Ala | Leu | Ser | Pro | Leu | Gly | Ala | Leu | Val | Ala | Cys | Tyr | Lys | Gly |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Val | Ser | Cys | Ser | Ile | Gly | Ser | Asn | Arg | Val | Gly | Ile | Ile | Lys | Gln | Leu |
| | | 130 | | | | | 135 | | | | | 140 | | | |
| Pro | Lys | Gly | Cys | Ser | | | | | | | | | | | |
| 145 | | | | | | | | | | | | | | | |

<210> 284
 <211> 149
 <212> PRT
 <213> human metapneumo virus

| | | | | | | | | | | | | | | | |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| <400> 284 | | | | | | | | | | | | | | | |
| Ile | Gly | Val | Tyr | Gly | Ser | Ser | Val | Ile | Tyr | Met | Val | Gln | Leu | Pro | Ile |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Phe | Gly | Val | Ile | Asp | Thr | Pro | Cys | Trp | Ile | Ile | Lys | Ala | Ala | Pro | Ser |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Cys | Ser | Glu | Lys | Asn | Gly | Asn | Tyr | Ala | Cys | Leu | Leu | Arg | Glu | Asp | Gln |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Gly | Trp | Tyr | Cys | Lys | Asn | Ala | Gly | Ser | Thr | Val | Tyr | Tyr | Pro | Asn | Glu |
| | | 50 | | | | 55 | | | | | 60 | | | | |
| Lys | Asp | Cys | Glu | Thr | Arg | Gly | Asp | His | Val | Phe | Cys | Asp | Thr | Ala | Ala |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Gly | Ile | Asn | Val | Ala | Glu | Gln | Ser | Arg | Glu | Cys | Asn | Ile | Asn | Ile | Ser |
| | | | | 85 | | | | | 90 | | | | 95 | | |
| Thr | Thr | Asn | Tyr | Pro | Cys | Lys | Val | Ser | Thr | Gly | Arg | His | Pro | Ile | Ser |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Met | Val | Ala | Leu | Ser | Pro | Leu | Gly | Ala | Leu | Val | Ala | Cys | Tyr | Lys | Gly |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Val | Ser | Cys | Ser | Ile | Gly | Ser | Asn | Arg | Val | Gly | Ile | Ile | Lys | Gln | Leu |
| | | 130 | | | | | 135 | | | | | 140 | | | |

Pro Lys Gly Cys Ser
145

<210> 285
<211> 149
<212> PRT
<213> human metapneumo virus

<400> 285
Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
1 5 10 15
Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Ile Lys Ala Ala Pro Ser
20 25 30
Cys Ser Glu Lys Asn Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
35 40 45
Gly Trp Tyr Cys Lys Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
50 55 60
Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
65 70 75 80
Gly Ile Asn Val Ala Glu Gln Ser Arg Glu Cys Asn Ile Asn Ile Ser
85 90 95
Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Ser Ile Ser
100 105 110
Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
115 120 125
Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
130 135 140
Pro Lys Gly Cys Ser
145

<210> 286
<211> 149
<212> PRT
<213> human metapneumo virus

<400> 286
Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
1 5 10 15
Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Ile Lys Ala Ala Pro Ser
20 25 30
Cys Ser Glu Lys Asn Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
35 40 45
Gly Trp Tyr Cys Lys Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
50 55 60
Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
65 70 75 80
Gly Ile Asn Val Ala Glu Gln Ser Arg Glu Cys Asn Ile Asn Ile Ser
85 90 95
Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
100 105 110
Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
115 120 125
Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
130 135 140
Pro Lys Gly Cys Ser
145

<210> 287

<211> 149
 <212> PRT
 <213> human metapneumo virus

<400> 287
 Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1 5 10 15
 Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Ile Lys Ala Ala Pro Ser
 20 25 30
 Cys Ser Glu Lys Asn Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
 35 40 45
 Gly Trp Tyr Cys Lys Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
 50 55 60
 Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
 65 70 75 80
 Gly Ile Asn Val Ala Glu Gln Ser Arg Glu Cys Asn Ile Asn Ile Ser
 85 90 95
 Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
 100 105 110
 Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
 115 120 125
 Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
 130 135 140
 Pro Lys Gly Cys Ser
 145

<210> 288
 <211> 149
 <212> PRT
 <213> human metapneumo virus

<400> 288
 Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1 5 10 15
 Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Ile Lys Ala Ala Pro Ser
 20 25 30
 Cys Ser Glu Lys Asn Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
 35 40 45
 Gly Trp Tyr Cys Lys Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
 50 55 60
 Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
 65 70 75 80
 Gly Ile Asn Val Ala Glu Gln Ser Arg Glu Cys Asn Ile Asn Ile Ser
 85 90 95
 Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
 100 105 110
 Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
 115 120 125
 Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
 130 135 140
 Pro Lys Gly Cys Ser
 145

<210> 289
 <211> 149
 <212> PRT
 <213> human metapneumo virus

<400> 289

Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1 5 10 15
 Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Ile Lys Ala Ala Pro Ser
 20 25 30
 Cys Ser Glu Lys Asn Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
 35 40 45
 Gly Trp Tyr Cys Lys Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
 50 55 60
 Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
 65 70 75 80
 Gly Ile Asn Val Ala Glu Gln Ser Arg Glu Cys Asn Ile Asn Ile Ser
 85 90 95
 Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
 100 105 110
 Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
 115 120 125
 Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
 130 135 140
 Pro Lys Gly Cys Ser
 145

<210> 290
 <211> 149
 <212> PRT
 <213> human metapneumo virus

<400> 290
 Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1 5 10 15
 Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Ile Lys Ala Ala Pro Ser
 20 25 30
 Cys Ser Glu Lys Asn Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
 35 40 45
 Gly Trp Tyr Cys Lys Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
 50 55 60
 Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
 65 70 75 80
 Gly Ile Asn Val Ala Glu Gln Ser Arg Glu Cys Asn Ile Asn Ile Ser
 85 90 95
 Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
 100 105 110
 Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
 115 120 125
 Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
 130 135 140
 Pro Lys Gly Cys Ser
 145

<210> 291
 <211> 149
 <212> PRT
 <213> human metapneumo virus

<400> 291
 Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1 5 10 15
 Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Ile Lys Ala Ala Pro Ser
 20 25 30
 Cys Ser Glu Lys Asn Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln

```

      35      40      45
Gly Trp Tyr Cys Lys Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
 50      55      60
Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
65      70      75      80
Gly Ile Asn Val Ala Glu Gln Ser Arg Glu Cys Asn Ile Asn Ile Ser
      85      90      95
Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
      100      105      110
Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
      115      120      125
Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
      130      135      140
Pro Lys Gly Cys Ser
145

```

```

<210> 292
<211> 149
<212> PRT
<213> human metapneumo virus

```

```

<400> 292
Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1      5      10      15
Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Ile Lys Ala Ala Pro Ser
      20      25      30
Cys Ser Glu Lys Asn Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
      35      40      45
Gly Trp Tyr Cys Lys Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
      50      55      60
Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
65      70      75      80
Gly Ile Asn Val Ala Glu Gln Ser Arg Glu Cys Asn Ile Asn Ile Ser
      85      90      95
Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
      100      105      110
Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
      115      120      125
Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
      130      135      140
Pro Lys Gly Cys Ser
145

```

```

<210> 293
<211> 149
<212> PRT
<213> human metapneumo virus

```

```

<400> 293
Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1      5      10      15
Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Ile Lys Ala Ala Pro Ser
      20      25      30
Cys Ser Glu Lys Asn Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
      35      40      45
Gly Trp Tyr Cys Lys Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
      50      55      60
Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
65      70      75      80

```

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Ile | Asn | Val | Ala | Glu | Gln | Ser | Arg | Glu | Cys | Asn | Ile | Asn | Ile | Ser |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Thr | Thr | Asn | Tyr | Pro | Cys | Lys | Val | Ser | Thr | Gly | Arg | His | Pro | Ile | Ser |
| | | 100 | | | | | | 105 | | | | | 110 | | |
| Met | Val | Ala | Leu | Ser | Pro | Leu | Gly | Ala | Leu | Val | Ala | Cys | Tyr | Lys | Gly |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Val | Ser | Cys | Ser | Ile | Gly | Ser | Asn | Arg | Val | Gly | Ile | Ile | Lys | Gln | Leu |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Pro | Lys | Gly | Cys | Ser | | | | | | | | | | | |
| 145 | | | | | | | | | | | | | | | |

<210> 294

<211> 149

<212> PRT

<213> human metapneumo virus

<400> 294

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ile | Gly | Val | Tyr | Gly | Ser | Ser | Val | Ile | Tyr | Met | Val | Gln | Leu | Pro | Ile |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Phe | Gly | Val | Ile | Asp | Thr | Pro | Cys | Trp | Ile | Ile | Lys | Ala | Ala | Pro | Ser |
| | | 20 | | | | | | 25 | | | | | 30 | | |
| Cys | Ser | Glu | Lys | Asn | Gly | Asn | Tyr | Ala | Cys | Leu | Leu | Arg | Glu | Asp | Gln |
| | | 35 | | | | 40 | | | | | | 45 | | | |
| Gly | Trp | Tyr | Cys | Lys | Asn | Ala | Gly | Ser | Thr | Val | Tyr | Tyr | Pro | Asn | Glu |
| | 50 | | | | 55 | | | | | | 60 | | | | |
| Lys | Asp | Cys | Glu | Thr | Arg | Gly | Asp | His | Val | Phe | Cys | Asp | Thr | Ala | Ala |
| 65 | | | | | 70 | | | | 75 | | | | | 80 | |
| Gly | Ile | Asn | Val | Ala | Glu | Gln | Ser | Arg | Glu | Cys | Asn | Ile | Asn | Ile | Ser |
| | | | 85 | | | | | | 90 | | | | | 95 | |
| Thr | Thr | Asn | Tyr | Pro | Cys | Lys | Val | Ser | Thr | Gly | Arg | His | Pro | Ile | Ser |
| | | 100 | | | | | | 105 | | | | | 110 | | |
| Met | Val | Ala | Leu | Ser | Pro | Leu | Gly | Ala | Leu | Val | Ala | Cys | Tyr | Lys | Gly |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Val | Ser | Cys | Ser | Ile | Gly | Ser | Asn | Arg | Val | Gly | Ile | Ile | Lys | Gln | Leu |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Pro | Lys | Gly | Cys | Ser | | | | | | | | | | | |
| 145 | | | | | | | | | | | | | | | |

<210> 295

<211> 149

<212> PRT

<213> human metapneumo virus

<400> 295

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ile | Gly | Val | Tyr | Gly | Ser | Ser | Val | Ile | Tyr | Met | Val | Gln | Leu | Pro | Ile |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Phe | Gly | Val | Ile | Asp | Thr | Pro | Cys | Trp | Ile | Ile | Lys | Ala | Ala | Pro | Ser |
| | | 20 | | | | | | 25 | | | | | 30 | | |
| Cys | Ser | Glu | Lys | Asn | Gly | Asn | Tyr | Ala | Cys | Leu | Leu | Arg | Glu | Asp | Gln |
| | | 35 | | | | 40 | | | | | | 45 | | | |
| Gly | Trp | Tyr | Cys | Lys | Asn | Ala | Gly | Ser | Thr | Val | Tyr | Tyr | Pro | Asn | Glu |
| | 50 | | | | 55 | | | | | | 60 | | | | |
| Lys | Asp | Cys | Glu | Thr | Arg | Gly | Asp | His | Val | Phe | Cys | Asp | Thr | Ala | Ala |
| 65 | | | | | 70 | | | | 75 | | | | | 80 | |
| Gly | Ile | Asn | Val | Ala | Glu | Gln | Ser | Arg | Glu | Cys | Asn | Ile | Asn | Ile | Ser |
| | | | 85 | | | | | | 90 | | | | | 95 | |
| Thr | Thr | Asn | Tyr | Pro | Cys | Lys | Val | Ser | Thr | Gly | Arg | His | Pro | Ile | Ser |
| | | 100 | | | | | | 105 | | | | | 110 | | |
| Met | Val | Ala | Leu | Ser | Pro | Leu | Gly | Ala | Leu | Val | Ala | Cys | Tyr | Lys | Gly |
| | | | | | | | | | | | | | | | |

115 120 125
 Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
 130 135 140
 Pro Lys Gly Cys Ser
 145

<210> 296
 <211> 149
 <212> PRT
 <213> human metapneumo virus

<400> 296
 Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1 5 10 15
 Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Ile Lys Ala Ala Pro Ser
 20 25 30
 Cys Ser Glu Lys Asn Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
 35 40 45
 Gly Trp Tyr Cys Lys Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
 50 55 60
 Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
 65 70 75 80
 Gly Ile Asn Val Ala Glu Gln Ser Arg Glu Cys Asn Ile Asn Ile Ser
 85 90 95
 Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
 100 105 110
 Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
 115 120 125
 Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
 130 135 140
 Pro Lys Gly Cys Ser
 145

<210> 297
 <211> 149
 <212> PRT
 <213> human metapneumo virus

<400> 297
 Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1 5 10 15
 Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Ile Lys Ala Ala Pro Ser
 20 25 30
 Cys Ser Glu Lys Asp Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
 35 40 45
 Gly Trp Tyr Cys Lys Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
 50 55 60
 Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
 65 70 75 80
 Gly Ile Asn Val Ala Glu Gln Ser Arg Glu Cys Asn Ile Asn Ile Ser
 85 90 95
 Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
 100 105 110
 Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
 115 120 125
 Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
 130 135 140
 Pro Lys Gly Cys Ser
 145

<210> 298
 <211> 149
 <212> PRT
 <213> human metapneumo virus

<400> 298
 Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1 5 10 15
 Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Ile Lys Ala Ala Pro Ser
 20 25 30
 Cys Ser Glu Lys Asp Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
 35 40 45
 Gly Trp Tyr Cys Lys Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
 50 55 60
 Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
 65 70 75 80
 Gly Ile Asn Val Ala Glu Gln Ser Arg Glu Cys Asn Ile Asn Ile Ser
 85 90 95
 Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
 100 105 110
 Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
 115 120 125
 Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
 130 135 140
 Pro Lys Gly Cys Ser
 145

<210> 299
 <211> 149
 <212> PRT
 <213> human metapneumo virus

<400> 299
 Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1 5 10 15
 Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Ile Lys Ala Ala Pro Ser
 20 25 30
 Cys Ser Glu Lys Asp Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
 35 40 45
 Gly Trp Tyr Cys Lys Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
 50 55 60
 Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
 65 70 75 80
 Gly Ile Asn Val Ala Glu Gln Ser Arg Glu Cys Asn Ile Asn Ile Ser
 85 90 95
 Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
 100 105 110
 Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
 115 120 125
 Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
 130 135 140
 Pro Lys Gly Cys Ser
 145

<210> 300
 <211> 149
 <212> PRT

<213> human metapneumo virus

<400> 300

```
Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1           5           10           15
Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Ile Lys Ala Ala Pro Ser
          20           25           30
Cys Ser Glu Lys Asp Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
          35           40           45
Gly Trp Tyr Cys Lys Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
          50           55           60
Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
65           70           75           80
Gly Ile Asn Val Ala Glu Gln Ser Arg Glu Cys Asn Ile Asn Ile Ser
          85           90           95
Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
          100          105          110
Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
          115          120          125
Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
          130          135          140
Pro Lys Gly Cys Ser
145
```

<210> 301

<211> 149

<212> PRT

<213> human metapneumo virus

<400> 301

```
Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1           5           10           15
Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Ile Lys Ala Ala Pro Ser
          20           25           30
Cys Ser Glu Lys Asp Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
          35           40           45
Gly Trp Tyr Cys Lys Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
          50           55           60
Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
65           70           75           80
Gly Ile Asn Val Ala Glu Gln Ser Arg Glu Cys Asn Ile Asn Ile Ser
          85           90           95
Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
          100          105          110
Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
          115          120          125
Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
          130          135          140
Pro Lys Gly Cys Ser
145
```

<210> 302

<211> 149

<212> PRT

<213> human metapneumo virus

<400> 302

```
Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1           5           10           15
```

Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Ile Lys Ala Ala Pro Ser
 20 25 30
 Cys Ser Glu Lys Asp Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
 35 40 45
 Gly Trp Tyr Cys Lys Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
 50 55 60
 Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
 65 70 75 80
 Gly Ile Asn Val Ala Glu Gln Ser Arg Glu Cys Asn Ile Asn Ile Ser
 85 90 95
 Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
 100 105 110
 Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
 115 120 125
 Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
 130 135 140
 Pro Lys Gly Cys Ser
 145

<210> 303
 <211> 149
 <212> PRT
 <213> human metapneumo virus

<400> 303
 Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1 5 10 15
 Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Ile Lys Ala Ala Pro Ser
 20 25 30
 Cys Ser Glu Lys Asp Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
 35 40 45
 Gly Trp Tyr Cys Lys Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
 50 55 60
 Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
 65 70 75 80
 Gly Ile Asn Val Ala Glu Gln Ser Arg Glu Cys Asn Ile Asn Ile Ser
 85 90 95
 Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
 100 105 110
 Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
 115 120 125
 Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
 130 135 140
 Pro Lys Gly Cys Ser
 145

<210> 304
 <211> 149
 <212> PRT
 <213> human metapneumo virus

<400> 304
 Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1 5 10 15
 Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Ile Lys Ala Ala Pro Ser
 20 25 30
 Cys Ser Glu Lys Asp Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
 35 40 45
 Gly Trp Tyr Cys Lys Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 50 | | 55 | | 60 | | | | | | | | | | | |
| Lys | Asp | Cys | Glu | Thr | Arg | Gly | Asp | His | Val | Phe | Cys | Asp | Thr | Ala | Ala |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Gly | Ile | Asn | Val | Ala | Glu | Gln | Ser | Arg | Glu | Cys | Asn | Ile | Asn | Ile | Ser |
| | | | 85 | | | | | | 90 | | | | | 95 | |
| Thr | Thr | Asn | Tyr | Pro | Cys | Lys | Val | Ser | Thr | Gly | Arg | His | Pro | Ile | Ser |
| | | 100 | | | | | | 105 | | | | | 110 | | |
| Met | Val | Ala | Leu | Ser | Pro | Leu | Gly | Ala | Leu | Val | Ala | Cys | Tyr | Lys | Gly |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Val | Ser | Cys | Ser | Ile | Gly | Ser | Asn | Arg | Val | Gly | Ile | Ile | Lys | Gln | Leu |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Pro | Lys | Gly | Cys | Ser | | | | | | | | | | | |
| 145 | | | | | | | | | | | | | | | |

<210> 305
 <211> 149
 <212> PRT
 <213> human metapneumo virus

| |
|---|
| <400> 305 |
| Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile |
| 1 5 10 15 |
| Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Ile Lys Ala Ala Pro Ser |
| 20 25 30 |
| Cys Ser Glu Lys Asp Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln |
| 35 40 45 |
| Gly Trp Tyr Cys Lys Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu |
| 50 55 60 |
| Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala |
| 65 70 75 80 |
| Gly Ile Asn Val Ala Glu Gln Ser Arg Glu Cys Asn Ile Asn Ile Ser |
| 85 90 95 |
| Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser |
| 100 105 110 |
| Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly |
| 115 120 125 |
| Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu |
| 130 135 140 |
| Pro Lys Gly Cys Ser |
| 145 |

<210> 306
 <211> 149
 <212> PRT
 <213> human metapneumo virus

| |
|---|
| <400> 306 |
| Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile |
| 1 5 10 15 |
| Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Ile Lys Ala Ala Pro Ser |
| 20 25 30 |
| Cys Ser Glu Lys Asp Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln |
| 35 40 45 |
| Gly Trp Tyr Cys Lys Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu |
| 50 55 60 |
| Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala |
| 65 70 75 80 |
| Gly Ile Asn Val Ala Glu Gln Ser Arg Glu Cys Asn Ile Asn Ile Ser |
| 85 90 95 |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Thr | Thr | Asn | Tyr | Pro | Cys | Lys | Val | Ser | Thr | Gly | Arg | His | Pro | Ile | Ser |
| | | 100 | | | | | | 105 | | | | | 110 | | |
| Met | Val | Ala | Leu | Ser | Pro | Leu | Gly | Ala | Leu | Val | Ala | Cys | Tyr | Lys | Gly |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Val | Ser | Cys | Ser | Ile | Gly | Ser | Asn | Arg | Val | Gly | Ile | Ile | Lys | Gln | Leu |
| | | 130 | | | | 135 | | | | | 140 | | | | |
| Pro | Lys | Gly | Cys | Ser | | | | | | | | | | | |
| 145 | | | | | | | | | | | | | | | |

<210> 307
 <211> 149
 <212> PRT
 <213> human metapneumo virus

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ile | Gly | Val | Tyr | Gly | Ser | Ser | Val | Ile | Tyr | Met | Val | Gln | Leu | Pro | Ile |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Phe | Gly | Val | Ile | Asp | Thr | Pro | Cys | Trp | Ile | Ile | Lys | Ala | Ala | Pro | Ser |
| | | 20 | | | | | | 25 | | | | | 30 | | |
| Cys | Ser | Glu | Lys | Asp | Gly | Asn | Tyr | Ala | Cys | Leu | Leu | Arg | Glu | Asp | Gln |
| | | 35 | | | | 40 | | | | | | 45 | | | |
| Gly | Trp | Tyr | Cys | Lys | Asn | Ala | Gly | Ser | Thr | Val | Tyr | Tyr | Pro | Asn | Glu |
| | 50 | | | | 55 | | | | | | 60 | | | | |
| Lys | Asp | Cys | Glu | Thr | Arg | Gly | Asp | His | Val | Phe | Cys | Asp | Thr | Ala | Ala |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Gly | Ile | Asn | Val | Ala | Glu | Gln | Ser | Arg | Glu | Cys | Asn | Ile | Asn | Ile | Ser |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Thr | Thr | Asn | Tyr | Pro | Cys | Lys | Val | Ser | Thr | Gly | Arg | His | Pro | Ile | Ser |
| | | 100 | | | | | | 105 | | | | | 110 | | |
| Met | Val | Ala | Leu | Ser | Pro | Leu | Gly | Ala | Leu | Val | Ala | Cys | Tyr | Lys | Gly |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Val | Ser | Cys | Ser | Ile | Gly | Ser | Asn | Arg | Val | Gly | Ile | Ile | Lys | Gln | Leu |
| | | 130 | | | | 135 | | | | | 140 | | | | |
| Pro | Lys | Gly | Cys | Ser | | | | | | | | | | | |
| 145 | | | | | | | | | | | | | | | |

<210> 308
 <211> 149
 <212> PRT
 <213> human metapneumo virus

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ile | Gly | Val | Tyr | Gly | Ser | Ser | Val | Ile | Tyr | Met | Val | Gln | Leu | Pro | Ile |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Phe | Gly | Val | Ile | Asp | Thr | Pro | Cys | Trp | Ile | Ile | Lys | Ala | Ala | Pro | Ser |
| | | 20 | | | | | | 25 | | | | | 30 | | |
| Cys | Ser | Glu | Lys | Asp | Gly | Asn | Tyr | Ala | Cys | Leu | Leu | Arg | Glu | Asp | Gln |
| | | 35 | | | | 40 | | | | | | 45 | | | |
| Gly | Trp | Tyr | Cys | Lys | Asn | Ala | Gly | Ser | Thr | Val | Tyr | Tyr | Pro | Asn | Glu |
| | 50 | | | | 55 | | | | | | 60 | | | | |
| Lys | Asp | Cys | Glu | Thr | Arg | Gly | Asp | His | Val | Phe | Cys | Asp | Thr | Ala | Ala |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Gly | Ile | Asn | Val | Ala | Glu | Gln | Ser | Arg | Glu | Cys | Asn | Ile | Asn | Ile | Ser |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Thr | Thr | Asn | Tyr | Pro | Cys | Lys | Val | Ser | Thr | Gly | Arg | His | Pro | Ile | Ser |
| | | 100 | | | | | | 105 | | | | | 110 | | |
| Met | Val | Ala | Leu | Ser | Pro | Leu | Gly | Ala | Leu | Val | Ala | Cys | Tyr | Lys | Gly |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Val | Ser | Cys | Ser | Ile | Gly | Ser | Asn | Arg | Val | Gly | Ile | Ile | Lys | Gln | Leu |
| | | | | | | | | | | | | | | | |

130
Pro Lys Gly Cys Ser
145

135

140

<210> 309
<211> 149
<212> PRT
<213> human metapneumo virus

<400> 309
Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
1 5 10 15
Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Ile Lys Ala Ala Pro Ser
20 25 30
Cys Ser Glu Lys Asp Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
35 40 45
Gly Trp Tyr Cys Lys Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
50 55 60
Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
65 70 75 80
Gly Ile Asn Val Ala Glu Gln Ser Arg Glu Cys Asn Ile Asn Ile Ser
85 90 95
Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
100 105 110
Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
115 120 125
Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
130 135 140
Pro Lys Gly Cys Ser
145

<210> 310
<211> 149
<212> PRT
<213> human metapneumo virus

<400> 310
Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
1 5 10 15
Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Ile Lys Ala Ala Pro Ser
20 25 30
Cys Ser Glu Lys Asp Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
35 40 45
Gly Trp Tyr Cys Lys Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
50 55 60
Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
65 70 75 80
Gly Ile Asn Val Ala Glu Gln Ser Arg Glu Cys Asn Ile Asn Ile Ser
85 90 95
Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
100 105 110
Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
115 120 125
Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
130 135 140
Pro Lys Gly Cys Ser
145

<210> 311
 <211> 149
 <212> PRT
 <213> human metapneumo virus

<400> 311
 Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1 5 10 15
 Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Ile Lys Ala Ala Pro Ser
 20 25 30
 Cys Ser Glu Lys Asp Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
 35 40 45
 Gly Trp Tyr Cys Lys Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
 50 55 60
 Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
 65 70 75 80
 Gly Ile Asn Val Ala Glu Gln Ser Arg Glu Cys Asn Ile Asn Ile Ser
 85 90 95
 Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
 100 105 110
 Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
 115 120 125
 Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
 130 135 140
 Pro Lys Gly Cys Ser
 145

<210> 312
 <211> 149
 <212> PRT
 <213> human metapneumo virus

<400> 312
 Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1 5 10 15
 Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Ile Lys Ala Ala Pro Ser
 20 25 30
 Cys Ser Glu Lys Asp Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
 35 40 45
 Gly Trp Tyr Cys Lys Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
 50 55 60
 Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
 65 70 75 80
 Gly Ile Asn Val Ala Glu Gln Ser Arg Glu Cys Asn Ile Asn Ile Ser
 85 90 95
 Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
 100 105 110
 Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
 115 120 125
 Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
 130 135 140
 Pro Lys Gly Cys Ser
 145

<210> 313
 <211> 149
 <212> PRT
 <213> human metapneumo virus

<400> 313
 Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln Leu Pro Ile
 1 5 10 15
 Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Ile Lys Ala Ala Pro Ser
 20 25 30
 Cys Ser Glu Lys Asp Gly Asn Tyr Ala Cys Leu Leu Arg Glu Asp Gln
 35 40 45
 Gly Trp Tyr Cys Lys Asn Ala Gly Ser Thr Val Tyr Tyr Pro Asn Glu
 50 55 60
 Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp Thr Ala Ala
 65 70 75 80
 Gly Ile Asn Val Ala Glu Gln Ser Arg Glu Cys Asn Ile Asn Ile Ser
 85 90 95
 Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His Pro Ile Ser
 100 105 110
 Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys Tyr Lys Gly
 115 120 125
 Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile Lys Gln Leu
 130 135 140
 Pro Lys Gly Cys Ser
 145

<210> 314
 <211> 539
 <212> PRT
 <213> human metapneumo virus

<400> 314
 Met Ser Trp Lys Val Val Ile Ile Phe Ser Leu Leu Ile Thr Pro Gln
 1 5 10 15
 His Gly Leu Lys Glu Ser Tyr Leu Glu Glu Ser Cys Ser Thr Ile Thr
 20 25 30
 Glu Gly Tyr Leu Ser Val Leu Arg Thr Gly Trp Tyr Thr Asn Val Phe
 35 40 45
 Thr Leu Glu Val Gly Asp Val Glu Asn Leu Thr Cys Ala Asp Gly Pro
 50 55 60
 Ser Leu Ile Lys Thr Glu Leu Asp Leu Thr Lys Ser Ala Leu Arg Glu
 65 70 75 80
 Leu Arg Thr Val Ser Ala Asp Gln Leu Ala Arg Glu Glu Gln Ile Glu
 85 90 95
 Asn Pro Arg Gln Ser Arg Phe Val Leu Gly Ala Ile Ala Leu Gly Val
 100 105 110
 Ala Thr Ala Ala Ala Val Thr Ala Gly Val Ala Ile Ala Lys Thr Ile
 115 120 125
 Arg Leu Glu Ser Glu Val Thr Ala Ile Lys Asn Ala Leu Lys Lys Thr
 130 135 140
 Asn Glu Ala Val Ser Thr Leu Gly Asn Gly Val Arg Val Leu Ala Thr
 145 150 155 160
 Ala Val Arg Glu Leu Lys Asp Phe Val Ser Lys Asn Leu Thr Arg Ala
 165 170 175
 Ile Asn Lys Asn Lys Cys Asp Ile Ala Asp Leu Lys Met Ala Val Ser
 180 185 190
 Phe Ser Gln Phe Asn Arg Arg Phe Leu Asn Val Val Arg Gln Phe Ser
 195 200 205
 Asp Asn Ala Gly Ile Thr Pro Ala Ile Ser Leu Asp Leu Met Thr Asp
 210 215 220
 Ala Glu Leu Ala Arg Ala Val Ser Asn Met Pro Thr Ser Ala Gly Gln
 225 230 235 240
 Ile Lys Leu Met Leu Glu Asn Arg Ala Met Val Arg Arg Lys Gly Phe
 245 250 255

Gly Ile Leu Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln
 260 265 270
 Leu Pro Ile Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Val Lys Ala
 275 280 285
 Ala Pro Ser Cys Ser Gly Lys Lys Gly Asn Tyr Ala Cys Leu Leu Arg
 290 295 300
 Glu Asp Gln Gly Trp Tyr Cys Gln Asn Ala Gly Ser Thr Val Tyr Tyr
 305 310 315 320
 Pro Asn Glu Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp
 325 330 335
 Thr Ala Ala Gly Ile Asn Val Ala Glu Gln Ser Lys Glu Cys Asn Ile
 340 345 350
 Asn Ile Ser Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His
 355 360 365
 Pro Ile Ser Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys
 370 375 380
 Tyr Lys Gly Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile
 385 390 395 400
 Lys Gln Leu Asn Lys Gly Cys Ser Tyr Ile Thr Asn Gln Asp Ala Asp
 405 410 415
 Thr Val Thr Ile Asp Asn Thr Val Tyr Gln Leu Ser Lys Val Glu Gly
 420 425 430
 Glu Gln His Val Ile Lys Gly Arg Pro Val Ser Ser Ser Phe Asp Pro
 435 440 445
 Val Lys Phe Pro Glu Asp Gln Phe Asn Val Ala Leu Asp Gln Val Phe
 450 455 460
 Glu Ser Ile Glu Asn Ser Gln Ala Leu Val Asp Gln Ser Asn Arg Ile
 465 470 475 480
 Leu Ser Ser Ala Glu Lys Gly Asn Thr Gly Phe Ile Ile Val Ile Ile
 485 490 495
 Leu Ile Ala Val Leu Gly Ser Thr Met Ile Leu Val Ser Val Phe Ile
 500 505 510
 Ile Ile Lys Lys Thr Lys Lys Pro Thr Gly Ala Pro Pro Glu Leu Ser
 515 520 525
 Gly Val Thr Asn Asn Gly Phe Ile Pro His Asn
 530 535

<210> 315

<211> 539

<212> PRT

<213> human metapneumo virus

<400> 315

Met Ser Trp Lys Val Val Ile Ile Phe Ser Leu Leu Ile Thr Pro Gln
 1 5 10 15
 His Gly Leu Lys Glu Ser Tyr Leu Glu Ser Cys Ser Thr Ile Thr
 20 25 30
 Glu Gly Tyr Leu Ser Val Leu Arg Thr Gly Trp Tyr Thr Asn Val Phe
 35 40 45
 Thr Leu Glu Val Gly Asp Val Glu Asn Leu Thr Cys Ser Asp Gly Pro
 50 55 60
 Ser Leu Ile Lys Thr Glu Leu Asp Leu Thr Lys Ser Ala Leu Arg Glu
 65 70 75 80
 Leu Lys Thr Val Ser Ala Asp Gln Leu Ala Arg Glu Glu Gln Ile Glu
 85 90 95
 Asn Pro Arg Gln Ser Arg Phe Val Leu Gly Ala Ile Ala Leu Gly Val
 100 105 110
 Ala Thr Ala Ala Ala Val Thr Ala Gly Val Ala Ile Ala Lys Thr Ile
 115 120 125
 Arg Leu Glu Ser Glu Val Thr Ala Ile Lys Asn Ala Leu Lys Thr Thr

| | | |
|---|---|-----|
| 130 | 135 | 140 |
| Asn Glu Ala Val Ser Thr | Leu Gly Asn Gly Val Arg Val Leu Ala Thr | |
| 145 | 150 | 155 |
| Ala Val Arg Glu Leu Lys Asp Phe Val Ser Lys Asn Leu Thr Arg Ala | | 160 |
| | 165 | 170 |
| Ile Asn Lys Asn Lys Cys Asp Ile Asp Asp Leu Lys Met Ala Val Ser | | 175 |
| | 180 | 185 |
| Phe Ser Gln Phe Asn Arg Arg Phe Leu Asn Val Val Arg Gln Phe Ser | | 190 |
| | 195 | 200 |
| Asp Asn Ala Gly Ile Thr Pro Ala Ile Ser Leu Asp Leu Met Thr Asp | | 205 |
| | 210 | 215 |
| Ala Glu Leu Ala Arg Ala Val Ser Asn Met Pro Thr Ser Ala Gly Gln | | 220 |
| 225 | 230 | 235 |
| Ile Lys Leu Met Leu Glu Asn Arg Ala Met Val Arg Arg Lys Gly Phe | | 240 |
| | 245 | 250 |
| Gly Ile Leu Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Thr Val Gln | | 255 |
| | 260 | 265 |
| Leu Pro Ile Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Val Lys Ala | | 270 |
| | 275 | 280 |
| Ala Pro Ser Cys Ser Glu Lys Lys Gly Asn Tyr Ala Cys Leu Leu Arg | | 285 |
| | 290 | 295 |
| Glu Asp Gln Gly Trp Tyr Cys Gln Asn Ala Gly Ser Thr Val Tyr Tyr | | 300 |
| 305 | 310 | 315 |
| Pro Asn Glu Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp | | 320 |
| | 325 | 330 |
| Thr Ala Ala Gly Ile Asn Val Ala Glu Gln Ser Lys Glu Cys Asn Ile | | 335 |
| | 340 | 345 |
| Asn Ile Ser Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His | | 350 |
| | 355 | 360 |
| Pro Ile Ser Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys | | 365 |
| | 370 | 375 |
| Tyr Lys Gly Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile | | 380 |
| 385 | 390 | 395 |
| Lys Gln Leu Asn Lys Gly Cys Ser Tyr Ile Thr Asn Gln Asp Ala Asp | | 400 |
| | 405 | 410 |
| Thr Val Thr Ile Asp Asn Thr Val Tyr Gln Leu Ser Lys Val Glu Gly | | 415 |
| | 420 | 425 |
| Glu Gln His Val Ile Lys Gly Arg Pro Val Ser Ser Ser Phe Asp Pro | | 430 |
| | 435 | 440 |
| Ile Lys Phe Pro Glu Asp Gln Phe Asn Val Ala Leu Asp Gln Val Phe | | 445 |
| | 450 | 455 |
| Glu Asn Ile Glu Asn Ser Gln Ala Leu Val Asp Gln Ser Asn Arg Ile | | 460 |
| 465 | 470 | 475 |
| Leu Ser Ser Ala Glu Lys Gly Asn Thr Gly Phe Ile Ile Val Ile Ile | | 480 |
| | 485 | 490 |
| Leu Ile Ala Val Leu Gly Ser Ser Met Ile Leu Val Ser Ile Phe Ile | | 495 |
| | 500 | 505 |
| Ile Ile Lys Lys Thr Lys Lys Pro Thr Gly Ala Pro Pro Glu Leu Ser | | 510 |
| | 515 | 520 |
| Gly Val Thr Asn Asn Gly Phe Ile Pro His Ser | | 525 |
| 530 | 535 | |

<210> 316

<211> 539

<212> PRT

<213> human metapneumo virus

<400> 316

| |
|---|
| Met Ser Trp Lys Val Met Ile Ile Ile Ser Leu Leu Ile Thr Pro Gln |
| 1 5 10 15 |

His Gly Leu Lys Glu Ser Tyr Leu Glu Glu Ser Cys Ser Thr Ile Thr
 20 25 30
 Glu Gly Tyr Leu Ser Val Leu Arg Thr Gly Trp Tyr Thr Asn Val Phe
 35 40 45
 Thr Leu Glu Val Gly Asp Val Glu Asn Leu Thr Cys Thr Asp Gly Pro
 50 55 60
 Ser Leu Ile Lys Thr Glu Leu Asp Leu Thr Lys Ser Ala Leu Arg Glu
 65 70 75 80
 Leu Lys Thr Val Ser Ala Asp Gln Leu Ala Arg Glu Glu Gln Ile Glu
 85 90 95
 Asn Pro Arg Gln Ser Arg Phe Val Leu Gly Ala Ile Ala Leu Gly Val
 100 105 110
 Ala Thr Ala Ala Val Thr Ala Gly Ile Ala Ile Ala Lys Thr Ile
 115 120 125
 Arg Leu Glu Ser Glu Val Asn Ala Ile Lys Gly Ala Leu Lys Gln Thr
 130 135 140
 Asn Glu Ala Val Ser Thr Leu Gly Asn Gly Val Arg Val Leu Ala Thr
 145 150 155 160
 Ala Val Arg Glu Leu Lys Glu Phe Val Ser Lys Asn Leu Thr Ser Ala
 165 170 175
 Ile Asn Arg Asn Lys Cys Asp Ile Ala Asp Leu Lys Met Ala Val Ser
 180 185 190
 Phe Ser Gln Phe Asn Arg Arg Phe Leu Asn Val Val Arg Gln Phe Ser
 195 200 205
 Asp Asn Ala Gly Ile Thr Pro Ala Ile Ser Leu Asp Leu Met Thr Asp
 210 215 220
 Ala Glu Leu Ala Arg Ala Val Ser Tyr Met Pro Thr Ser Ala Gly Gln
 225 230 235 240
 Ile Lys Leu Met Leu Glu Asn Arg Ala Met Val Arg Arg Lys Gly Phe
 245 250 255
 Gly Ile Leu Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln
 260 265 270
 Leu Pro Ile Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Ile Lys Ala
 275 280 285
 Ala Pro Ser Cys Ser Glu Lys Asn Gly Asn Tyr Ala Cys Leu Leu Arg
 290 295 300
 Glu Asp Gln Gly Trp Tyr Cys Lys Asn Ala Gly Ser Thr Val Tyr Tyr
 305 310 315 320
 Pro Asn Glu Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp
 325 330 335
 Thr Ala Ala Gly Ile Asn Val Ala Glu Gln Ser Arg Glu Cys Asn Ile
 340 345 350
 Asn Ile Ser Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His
 355 360 365
 Pro Ile Ser Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys
 370 375 380
 Tyr Lys Gly Val Ser Cys Ser Ile Gly Ser Asn Trp Val Gly Ile Ile
 385 390 395 400
 Lys Gln Leu Pro Lys Gly Cys Ser Tyr Ile Thr Asn Gln Asp Ala Asp
 405 410 415
 Thr Val Thr Ile Asp Asn Thr Val Tyr Gln Leu Ser Lys Val Glu Gly
 420 425 430
 Glu Gln His Val Ile Lys Gly Arg Pro Val Ser Ser Ser Phe Asp Pro
 435 440 445
 Ile Lys Phe Pro Glu Asp Gln Phe Asn Val Ala Leu Asp Gln Val Phe
 450 455 460
 Glu Ser Ile Glu Asn Ser Gln Ala Leu Val Asp Gln Ser Asn Lys Ile
 465 470 475 480
 Leu Asn Ser Ala Glu Lys Gly Asn Thr Gly Phe Ile Ile Val Val Ile
 485 490 495
 Leu Val Ala Val Leu Gly Leu Thr Met Ile Ser Val Ser Ile Ile Ile

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | | 500 | | | | | 505 | | | | 510 | | | |
| Ile | Ile | Lys | Lys | Thr | Arg | Lys | Pro | Thr | Gly | Ala | Pro | Pro | Glu | Leu | Asn |
| | | 515 | | | | | 520 | | | | | 525 | | | |
| Gly | Val | Thr | Asn | Gly | Gly | Phe | Ile | Pro | His | Ser | | | | | |
| | | 530 | | | | 535 | | | | | | | | | |

<210> 317
 <211> 539
 <212> PRT
 <213> human metapneumo virus

<400> 317

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ser | Trp | Lys | Val | Met | Ile | Ile | Ile | Ser | Leu | Leu | Ile | Thr | Pro | Gln |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| His | Gly | Leu | Lys | Glu | Ser | Tyr | Leu | Glu | Glu | Ser | Cys | Ser | Thr | Ile | Thr |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Glu | Gly | Tyr | Leu | Ser | Val | Leu | Arg | Thr | Gly | Trp | Tyr | Thr | Asn | Val | Phe |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Thr | Leu | Glu | Val | Gly | Asp | Val | Glu | Asn | Leu | Thr | Cys | Thr | Asp | Gly | Pro |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Ser | Leu | Ile | Lys | Thr | Glu | Leu | Asp | Leu | Thr | Lys | Ser | Ala | Leu | Arg | Glu |
| 65 | | | | 70 | | | | | | 75 | | | | | 80 |
| Leu | Lys | Thr | Val | Ser | Ala | Asp | Gln | Leu | Ala | Arg | Glu | Glu | Gln | Ile | Glu |
| | | | 85 | | | | | | 90 | | | | | 95 | |
| Asn | Pro | Arg | Gln | Ser | Arg | Phe | Val | Leu | Gly | Ala | Ile | Ala | Leu | Gly | Val |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Ala | Thr | Ala | Ala | Ala | Val | Thr | Ala | Gly | Ile | Ala | Ile | Ala | Lys | Thr | Ile |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Arg | Leu | Glu | Ser | Glu | Val | Asn | Ala | Ile | Lys | Gly | Ala | Leu | Lys | Thr | Thr |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Asn | Glu | Ala | Val | Ser | Thr | Leu | Gly | Asn | Gly | Val | Arg | Val | Leu | Ala | Thr |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Ala | Val | Arg | Glu | Leu | Lys | Glu | Phe | Val | Ser | Lys | Asn | Leu | Thr | Ser | Ala |
| | | | 165 | | | | | | 170 | | | | | 175 | |
| Ile | Asn | Lys | Asn | Lys | Cys | Asp | Ile | Ala | Asp | Leu | Lys | Met | Ala | Val | Ser |
| | | 180 | | | | | | 185 | | | | | 190 | | |
| Phe | Ser | Gln | Phe | Asn | Arg | Arg | Phe | Leu | Asn | Val | Val | Arg | Gln | Phe | Ser |
| | 195 | | | | | | 200 | | | | | 205 | | | |
| Asp | Asn | Ala | Gly | Ile | Thr | Pro | Ala | Ile | Ser | Leu | Asp | Leu | Met | Thr | Asp |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Ala | Glu | Leu | Ala | Arg | Ala | Val | Ser | Tyr | Met | Pro | Thr | Ser | Ala | Gly | Gln |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 |
| Ile | Lys | Leu | Met | Leu | Glu | Asn | Arg | Ala | Met | Val | Arg | Arg | Lys | Gly | Phe |
| | | | 245 | | | | | | 250 | | | | | 255 | |
| Gly | Ile | Leu | Ile | Gly | Val | Tyr | Gly | Ser | Ser | Val | Ile | Tyr | Met | Val | Gln |
| | | 260 | | | | | 265 | | | | | | 270 | | |
| Leu | Pro | Ile | Phe | Gly | Val | Ile | Asp | Thr | Pro | Cys | Trp | Ile | Ile | Lys | Ala |
| | 275 | | | | | | 280 | | | | | 285 | | | |
| Ala | Pro | Ser | Cys | Ser | Glu | Lys | Asp | Gly | Asn | Tyr | Ala | Cys | Leu | Leu | Arg |
| | 290 | | | | | 295 | | | | | 300 | | | | |
| Glu | Asp | Gln | Gly | Trp | Tyr | Cys | Lys | Asn | Ala | Gly | Ser | Thr | Val | Tyr | Tyr |
| 305 | | | | | 310 | | | | | 315 | | | | | 320 |
| Pro | Asn | Glu | Lys | Asp | Cys | Glu | Thr | Arg | Gly | Asp | His | Val | Phe | Cys | Asp |
| | | | 325 | | | | | | 330 | | | | | 335 | |
| Thr | Ala | Ala | Gly | Ile | Asn | Val | Ala | Glu | Gln | Ser | Arg | Glu | Cys | Asn | Ile |
| | | | 340 | | | | | 345 | | | | | 350 | | |
| Asn | Ile | Ser | Thr | Thr | Asn | Tyr | Pro | Cys | Lys | Val | Ser | Thr | Gly | Arg | His |
| | 355 | | | | | 360 | | | | | | 365 | | | |
| Pro | Ile | Ser | Met | Val | Ala | Leu | Ser | Pro | Leu | Gly | Ala | Leu | Val | Ala | Cys |
| | 370 | | | | | 375 | | | | | 380 | | | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Tyr | Lys | Gly | Val | Ser | Cys | Ser | Ile | Gly | Ser | Asn | Arg | Val | Gly | Ile | Ile |
| 385 | | | | | 390 | | | | | 395 | | | | | 400 |
| Lys | Gln | Leu | Pro | Lys | Gly | Cys | Ser | Tyr | Ile | Thr | Asn | Gln | Asp | Ala | Asp |
| | | | | 405 | | | | | 410 | | | | | 415 | |
| Thr | Val | Thr | Ile | Asp | Asn | Thr | Val | Tyr | Gln | Leu | Ser | Lys | Val | Glu | Gly |
| | | | 420 | | | | | 425 | | | | | 430 | | |
| Glu | Gln | His | Val | Ile | Lys | Gly | Arg | Pro | Val | Ser | Ser | Ser | Phe | Asp | Pro |
| | | 435 | | | | 440 | | | | | | 445 | | | |
| Ile | Arg | Phe | Pro | Glu | Asp | Gln | Phe | Asn | Val | Ala | Leu | Asp | Gln | Val | Phe |
| | 450 | | | | | 455 | | | | | 460 | | | | |
| Glu | Ser | Ile | Glu | Asn | Ser | Gln | Ala | Leu | Val | Asp | Gln | Ser | Asn | Lys | Ile |
| 465 | | | | 470 | | | | | | 475 | | | | | 480 |
| Leu | Asn | Ser | Ala | Glu | Lys | Gly | Asn | Thr | Gly | Phe | Ile | Ile | Val | Ile | Ile |
| | | | | 485 | | | | | 490 | | | | | 495 | |
| Leu | Ile | Ala | Val | Leu | Gly | Leu | Thr | Met | Ile | Ser | Val | Ser | Ile | Ile | Ile |
| | | | 500 | | | | | 505 | | | | | 510 | | |
| Ile | Ile | Lys | Lys | Thr | Arg | Lys | Pro | Thr | Gly | Ala | Pro | Pro | Glu | Leu | Asn |
| | | 515 | | | | | 520 | | | | | 525 | | | |
| Gly | Val | Thr | Asn | Gly | Gly | Phe | Ile | Pro | His | Ser | | | | | |
| | | 530 | | | | 535 | | | | | | | | | |

<210> 318
 <211> 1620
 <212> DNA
 <213> human metapneumo virus

<400> 318
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 gagagctact tagaagagtc atgtagcact ataactgaag gatattctcag tgttctgagg 120
 acagggttgg acaccaatgt ttttacactg gaggtaggcg atgtagagaa cttacatgt 180
 gccgatggac ccagcttaat aaaaacagaa ttagacctga ccaaaagtgc actaagagag 240
 ctccagaacag tttctgctga tcaactggca agagaggagc aaattgaaaa tcccagacaa 300
 tctagattcg ttctaggagc aatagcactc ggtgttgcaa ctgcagctgc agttacagca 360
 ggtgttgcaa ttgccaaaac catccggctt gaaagtgaag taacagcaat taagaatgcc 420
 ctcaaaaaga ccaatgaagc agtatctaca ttggggaatg gagttcgtgt gttggcaact 480
 gcagtgaagc agctgaaaga tttgtgagc aagaatctaa cacgtgcaat caacaaaaac 540
 aagtgcgaca ttgctgacct gaaaatggcc gttagcttca gtcaattcaa cagaagggtc 600
 ctcaaatgtt gtcggcaatt ttcagacaac gctggaataa caccagcaat atctttggac 660
 ttaatgacag atgctgaact agccagagct gtttccaaca tgccaacatc tgcaggacaa 720
 ataaaactga tgttgagaga ccgtgcaatg gtaagaagaa aagggttcgg aatcctgata 780
 ggagtttacg gaagctccgt aatttacatg gtgcaactgc caatctttgg gggttatagac 840
 acgccttgct ggatagtaaa agcagcccct tcttgttcag gaaaaaaggg aaactatgct 900
 tgcctcttaa gagaagacca aggatggtat tgtcaaaatg cagggtcaac tgtttactac 960
 ccaaatgaaa aagactgtga aacaagagga gaccatgtct tttgcgacac agcagcagga 1020
 atcaatgttg ctgagcagtc aaaggagtgc aacataaaca tatctactac taattaccca 1080
 tgcaaaagta gcacaggaag acatcctatc agtatggttg cactatctcc tcttggggct 1140
 ttggttgctt gctacaaggg agtgagctgt tccattggca gcaacagagt agggatcatc 1200
 aagcaactga acaaaggctg ctcttatata accaaccaag acgcagacac agtgacaata 1260
 gacaacactg tataccagct aagcaaagtt gaaggcgaac agcatgttat aaaaggaagg 1320
 ccagtgtcaa gcagctttga cccagtcaag tttcctgaag atcaattcaa tgttgcaact 1380
 gaccaagttt tcgagagcat tgagaacagt caggccttgg tggatcaatc aaacagaatc 1440
 ctaagcagtg cagagaaaag aaacactggc ttcattcatt taataattct aattgctgtc 1500
 cttggctcta ccatgatcct agtgagtgtt tttatcataa taaagaaaac aaagaaacc 1560
 acaggagcac ctccagagct gagtgggtgc acaacaatg gcttcatacc acataattag 1620

<210> 319
 <211> 1620
 <212> DNA
 <213> human metapneumo virus

<400> 319

| | | | | | | |
|-------------|-------------|-------------|-------------|------------|------------|------|
| atgtccttgga | aagtggatgat | catttttttca | ttgctaataa | cacctcaaca | cggtctttaa | 60 |
| gagagctacc | tagaagaatc | atgtagcact | ataactgagg | gatatcttag | tggtctgagg | 120 |
| acagggttgg | ataccaacgt | ttttacatta | gaggtgggtg | atgtagaaaa | ccttacatgt | 180 |
| tctgatggac | ctagccta | aaaaacagaa | ttagatctga | ccaaaagtgc | actaagagag | 240 |
| ctcaaaacag | tctctgctga | ccaattggca | agagaggaac | aaattgagaa | tcccagacaa | 300 |
| tctaggtttg | ttctaggagc | aatagcactc | ggtgttgcaa | cagcagctgc | agtcacagca | 360 |
| ggtgttgcaa | ttgccaaaac | catccggctt | gagagtgaag | tcacagcaat | taagaatgcc | 420 |
| ctcaaaacga | ccaatgaagc | agtatctaca | ttgggggaatg | gagttcagag | gttggcaact | 480 |
| gcagtggagag | agctaaaaga | ctttgtgagc | agaattttaa | ctcgtgcaat | caacaaaaac | 540 |
| aagtgcgaca | ttgatgacct | aaaaatggct | gttagcttca | gtcaattcaa | cagaagggtt | 600 |
| ctaaatggtg | tgcggaattt | ttcagacaat | gctggaataa | caccagcaat | atctttggac | 660 |
| ttaatgcagag | atgctgaact | agccaggggc | gtttctaacaa | tgccgacatc | tgcaggacaa | 720 |
| ataaaattga | tggtggagaa | ccgtgcatg | gtgcgaagaa | aggggttcgg | aatcctgata | 780 |
| ggggtctacg | ggagctccgt | aatttacacg | gtgcagctgc | caatctttgg | cgttatagac | 840 |
| acgccttgct | ggatagtaaa | agcagccctt | tcttggtccg | aaaaaaagg | aaactatgct | 900 |
| tgcctcttaa | gagaagacca | agggtggtat | tgtcagaatg | cagggtcaac | tgtttactac | 960 |
| ccaaatgaga | aagactgtga | aacaagagga | gaccatgtct | tttgcgacac | agcagcagga | 1020 |
| attaatggtg | ctgagcaatc | aaaggagtgc | aacatcaaca | tatccactac | aaattaccca | 1080 |
| tgcaaagtca | gcacaggaag | acatccctac | agttatgggtg | cactgtctcc | tcttggggct | 1140 |
| ctgggttgctt | gctacaaagg | agtaagctgt | tccattgggca | gcaacagagt | agggatcatc | 1200 |
| aagcagctga | acaaagggtg | ctcctatata | accaaccaag | atgcagacac | agtgacaata | 1260 |
| gacaacactg | tatatcagct | aagcaaagtt | gaggggtgaac | agcatgttat | aaaaggcaga | 1320 |
| ccagtgtcaa | gcagctttga | tccaatcaag | tttctgaag | atcaattcaa | tggtgcactt | 1380 |
| gaccaagttt | ttgagaacat | tgaaaacagc | caggccttag | tagatcaatc | aaacagaatc | 1440 |
| ctaagcagtg | cagagaaaagg | gaatactggc | tttatcattg | taataattct | aattgctgtc | 1500 |
| cttggctcta | gcattgatcct | agtgagcatc | ttcattataa | tcaagaaaac | aaagaaacca | 1560 |
| acgggagcac | ctccagagct | gagtgggtgc | acaaacaatg | gcttcatacc | acacagttag | 1620 |

<210> 320

<211> 1620

<212> DNA

<213> human metapneumo virus

<400> 320

| | | | | | | |
|-------------|-------------|-------------|-------------|------------|-------------|------|
| atgtccttgga | aagtgatgat | catcatttctg | ttactcataa | caccccagca | cggtgctaaag | 60 |
| gagagttatt | tggaagaatc | atgtagtact | ataactgagg | gatacctcag | tggttttaaga | 120 |
| acaggctggg | acactaatgt | cttcacatta | gaagttgggtg | atgttgaaaa | tcttacatgt | 180 |
| actgatggac | ctagctta | caaaacagaa | cttgatctaa | caaaaagtgc | tttaagggaa | 240 |
| ctcaaaacag | tctctgctga | tcagttggcg | agagagggagc | aaattgaaaa | tcccagacaa | 300 |
| tcaagatttg | tcttaggtgc | gatagctctc | ggagttgcta | cagcagcagc | agtcacagca | 360 |
| ggcattgcaa | tagccaaaac | cataaggctt | gagagtggag | tgaatgcaat | taaagggtgc | 420 |
| ctcaaacaaa | ctaattgaagc | agtatccaca | ttagggaaatg | gtgtgcgggt | cctagccact | 480 |
| gcagtggagag | agctaaaaga | atgtgtgagc | aaaaaacctga | ctagtgcatt | caacaggaac | 540 |
| aaatgtgaca | ttgctgatct | gaagatggct | gtcagcttca | gtcaattcaa | cagaagattt | 600 |
| ctaaatggtg | tgcggcagtt | ttcagacaat | gcagggataa | caccagcaat | atcattggac | 660 |
| ctgatgactg | atgctgagtt | ggccagagct | gtatcataca | tgccaacatc | tgcagggcag | 720 |
| ataaaactga | tggtggagaa | ccgcgcaatg | gtaaggagaa | aaggatttgg | aatcctgata | 780 |
| ggggtctacg | gaagctctgt | gattttacatg | gttcaattgc | cgatctttgg | tgtcatagat | 840 |
| acaccttggt | ggatcatcaa | ggcagctccc | tcttgctcag | aaaaaaacgg | gaattatgct | 900 |
| tgccctctaa | gagaggatca | aggggtggat | gtataaaatg | caggatctac | tgtttactac | 960 |
| ccaaatgaaa | aagactgcga | aacaagaggt | tgatcatgtt | tttgtgacac | agcagcagg | 1020 |
| atcaatggtg | ctgagcaatc | aagagaatgc | aacatcaaca | tatctactac | caactaccca | 1080 |
| tgcaaagtca | gcacaggaag | acaccctata | agcatgggtg | cactatcacc | tctcggtgct | 1140 |
| ttgggtggctt | gctataaagg | ggtaagctgc | tcgattggca | gcaattgggt | tggaatcatc | 1200 |
| aaacaattac | ccaaaggctg | ctcatacata | accaaccagg | atgcagacac | tgtaacaatt | 1260 |
| gacaataaccg | tgtatcaact | aagcaaagtt | gaagggtgaac | agcatgtaat | aaaaggggaga | 1320 |
| ccagtttcaa | gcagttttga | tccaatcaag | tttctgagg | atcagttcaa | tggtgcgctt | 1380 |
| gatcaagtct | tcgaaagcat | tgagaacagt | caggcactag | tggaccagtc | aaacaaaatt | 1440 |

```

ctaaacagtg cagaaaaagg aaacactggg ttcattatcg tagtaatfff ggttgctggt 1500
cttgggtctaa ccatgatttc agtgagcatc atcatcataa tcaagaaaaac aaggaagccc 1560
acaggagcac ctccagagct gaatgggtgtc accaacggcg gtttcatacc acatagttag 1620

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<210> 321
<211> 1620
<212> DNA
<213> human metapneumo virus

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<400> 321
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gaaagttatt tagaagaatc atgtagtact ataactgaag gatattctcag tgttttaaga 120
acaggttggg acaccaatgt ctttacatta gaagttgggt atggtgaaaa tcttacatgt 180
actgatggac ctagcttaat caaaacagaa cttgacctaa ccaaaagtgc tctgagagaa 240
ctcaaaacag tttctgctga tcagttagcg agagaagaac aaattgaaaa tcccagacaa 300
tcaaggtttg tcctaggtgc aatagctctt ggagttgcc aagcagcagc agtcacagca 360
ggcattgcaa tagccaaaac cataagactt gagagtgaag tgaatgcaat caaaggtgct 420
ctcaaaacaa ccaacgaggg agtatccaca ctaggaaatg gagtgcgagt cctagccact 480
gcagtaagag agctgaaaga atttgtgagc aaaaacctga ctagtgcgat caacaagaac 540
aaatgtgaca ttgctgatct gaagatggct gtcagcttca gtcaattcaa cagaagattc 600
ctaaatgttg tgcggcagtt ttcagacaat gcagggataa caccagcaat atcattggac 660
ctaagtactg atgctgagct ggccagagct gtatcataca tgccaacatc tgcaggacag 720
ataaaactaa tggtagagaa ccgtgcaatg gtgaggagaa aaggatttgg aatcttgata 780
ggggtctacg gaagctctgt gatttacatg gtccagctgc cgatctttgg tgtcatagat 840
acaccttggt ggataatcaa ggcagctccc tcttgttcag aaaaagatgg aaattatgct 900
tgcctcctaa gagaggatca agggtggtat tgcaaaaatg caggatccac tgtttactac 960
ccaaatgaaa aagactgcga aacaagaggt gatcatgttt tttgtgacac agcagcaggg 1020
atcaatgttg ctgagcaatc aagagaatgc aacatcaaca tatctaccac caactacca 1080
tgcaaagtca gcacaggaag acacctatc agcatgggtg cactatcacc tctcgggtgct 1140
ttggtagctt gctacaaggg ggtagctgc tgcattggca gtaatcgggt tggataaatc 1200
aaacaactac ctaaaggctg ctcatacata actaaccagg acgcagacac tgtaacaatt 1260
gacaacactg tgtatcaact aagcaaagtt gaggggtgaac agcatgtaat aaaagggaga 1320
ccagtttcaa gcagttttga tccaatcagg tttcctgagg atcagttcaa tgttgcgctt 1380
gatcaagtct ttgaaagcat tgaaaacagt caagcactag tggaccagtc aaacaaaatt 1440
ctgaacagtg cagaaaaagg aaacactggg ttcattattg taataatfff gattgctggt 1500
cttgggttaa ccatgatttc agtgagcatc atcatcataa tcaaaaaaac aaggaagccc 1560
acagggggcac ctccagagct gaatgggtgtt accaacggcg gttttatacc gcatagttag 1620

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<210> 322
<211> 236
<212> PRT
<213> human metapneumo virus

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<400> 322
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Arg Val Lys Asn Arg Val Ala Arg Ser Lys Cys Phe Lys Asn Ala Ser
20 25 30
Leu Val Leu Ile Gly Ile Thr Thr Leu Ser Ile Ala Leu Asn Ile Tyr
35 40 45
Leu Ile Ile Asn Tyr Lys Met Gln Lys Asn Thr Ser Glu Ser Glu His
50 55 60
His Thr Ser Ser Ser Pro Met Glu Ser Ser Arg Glu Thr Pro Thr Val
65 70 75 80
Pro Thr Asp Asn Ser Asp Thr Asn Ser Ser Pro Gln His Pro Thr Gln
85 90 95
Gln Ser Thr Glu Gly Ser Thr Leu Tyr Phe Ala Ala Ser Ala Ser Ser
100 105 110
Pro Glu Thr Glu Pro Thr Ser Thr Pro Asp Thr Thr Asn Arg Pro Pro

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| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Lys | Ile | Lys | Asn | Arg | Ile | Arg | Ser | Ser | Arg | Cys | Tyr | Arg | Asn | Ala | Thr |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Leu | Ile | Leu | Ile | Gly | Leu | Thr | Ala | Leu | Ser | Met | Ala | Leu | Asn | Ile | Phe |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Leu | Ile | Ile | Asp | His | Ala | Thr | Leu | Arg | Asn | Met | Ile | Lys | Thr | Glu | Asn |
| | | 50 | | | | 55 | | | | | 60 | | | | |
| Cys | Ala | Asn | Met | Pro | Ser | Ala | Glu | Pro | Ser | Lys | Lys | Thr | Pro | Met | Thr |
| 65 | | | | | 70 | | | | | 75 | | | | 80 | |
| Ser | Thr | Ala | Gly | Pro | Asn | Thr | Lys | Pro | Asn | Pro | Gln | Gln | Ala | Thr | Gln |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Trp | Thr | Thr | Glu | Asn | Ser | Thr | Ser | Pro | Val | Ala | Thr | Pro | Glu | Gly | His |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Pro | Tyr | Thr | Gly | Thr | Thr | Gln | Thr | Ser | Asp | Thr | Thr | Ala | Pro | Gln | Gln |
| | | 115 | | | | 120 | | | | | | 125 | | | |
| Thr | Thr | Asp | Lys | His | Thr | Ala | Pro | Leu | Lys | Ser | Thr | Asn | Glu | Gln | Ile |
| | | 130 | | | | 135 | | | | | 140 | | | | |
| Thr | Gln | Thr | Thr | Thr | Glu | Lys | Lys | Thr | Ile | Arg | Ala | Thr | Thr | Gln | Lys |
| 145 | | | | | 150 | | | | | 155 | | | | 160 | |
| Arg | Glu | Lys | Gly | Lys | Glu | Asn | Thr | Asn | Gln | Thr | Thr | Ser | Thr | Ala | Ala |
| | | | | 165 | | | | | 170 | | | | | 175 | |
| Thr | Gln | Thr | Thr | Asn | Thr | Thr | Asn | Gln | Ile | Arg | Asn | Ala | Ser | Glu | Thr |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Ile | Thr | Thr | Ser | Asp | Arg | Pro | Arg | Thr | Asp | Thr | Thr | Thr | Gln | Ser | Ser |
| | | 195 | | | | 200 | | | | | | 205 | | | |
| Glu | Gln | Thr | Thr | Arg | Ala | Thr | Asp | Pro | Ser | Ser | Pro | Pro | His | His | Ala |
| | | 210 | | | | 215 | | | | | 220 | | | | |

<210> 325

<211> 236

<212> PRT

<213> human metapneumo virus

<400> 325

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Glu | Val | Arg | Val | Glu | Asn | Ile | Arg | Ala | Ile | Asp | Met | Phe | Lys | Ala |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Lys | Met | Lys | Asn | Arg | Ile | Arg | Ser | Ser | Lys | Cys | Tyr | Arg | Asn | Ala | Thr |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Leu | Ile | Leu | Ile | Gly | Leu | Thr | Ala | Leu | Ser | Met | Ala | Leu | Asn | Ile | Phe |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Leu | Ile | Ile | Asp | Tyr | Ala | Met | Leu | Lys | Asn | Met | Thr | Lys | Val | Glu | His |
| | | 50 | | | | 55 | | | | | 60 | | | | |
| Cys | Val | Asn | Met | Pro | Pro | Val | Glu | Pro | Ser | Lys | Lys | Thr | Pro | Met | Thr |
| 65 | | | | | 70 | | | | | 75 | | | | 80 | |
| Ser | Ala | Val | Asp | Leu | Asn | Thr | Lys | Pro | Asn | Pro | Gln | Gln | Ala | Thr | Gln |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Leu | Ala | Ala | Glu | Asp | Ser | Thr | Ser | Leu | Ala | Ala | Thr | Ser | Glu | Asp | His |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Leu | His | Thr | Gly | Thr | Thr | Pro | Thr | Pro | Asp | Ala | Thr | Val | Ser | Gln | Gln |
| | | 115 | | | | 120 | | | | | | 125 | | | |
| Thr | Thr | Asp | Glu | Tyr | Thr | Thr | Leu | Leu | Arg | Ser | Thr | Asn | Arg | Gln | Thr |
| | | 130 | | | | 135 | | | | | 140 | | | | |
| Thr | Gln | Thr | Thr | Thr | Glu | Lys | Lys | Pro | Thr | Gly | Ala | Thr | Thr | Lys | Lys |
| 145 | | | | | 150 | | | | | 155 | | | | 160 | |
| Glu | Thr | Thr | Thr | Arg | Thr | Thr | Ser | Thr | Ala | Ala | Thr | Gln | Thr | Leu | Asn |
| | | | | 165 | | | | | 170 | | | | | 175 | |
| Thr | Thr | Asn | Gln | Thr | Ser | Tyr | Val | Arg | Glu | Ala | Thr | Thr | Thr | Ser | Ala |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Arg | Ser | Arg | Asn | Ser | Ala | Thr | Thr | Gln | Ser | Ser | Asp | Gln | Thr | Thr | Gln |
| | | 195 | | | | 200 | | | | | | 205 | | | |
| Ala | Ala | Asp | Pro | Ser | Ser | Gln | Pro | His | His | Thr | Gln | Lys | Ser | Thr | Thr |

| | | | | |
|---|--|-----|--|-----|
| 210 | | 215 | | 220 |
| Thr Thr Tyr Asn Thr Asp Thr Ser Ser Pro Ser Ser | | | | |
| 225 | | 230 | | 235 |

<210> 326
 <211> 708
 <212> DNA
 <213> human metapneumo virus

<400> 326
 gaggtgaaag tggagaacat tcgaacaata gatatgctca aagcaagagt aaaaaatcgt 60
 gtggcacgca gcaaatgctt taaaaatgcc tctttggtcc tcataggaat aactacattg 120
 agtattgccc tcaatatcta tctgatcata aactataaaa tgcaaaaaaa cacatctgaa 180
 tcagaacatc acaccagctc atcaccatg gaatccagca gagaaactcc aacgggtcccc 240
 acagacaact cagacaccaa ctcaagccca cagcatccaa ctcaacagtc cacagaaggc 300
 tccacactct actttgcagc ctccagcaagc tcaccagaga cagaaccaac atcaacacca 360
 gatacaacaa accgcccgcg cttcgtcgcac acacacacaa caccaccaag cgcaagcaga 420
 acaaagacaa gtccggcagc ccacacacaaa aacaacccaa ggacaagctc tagaacacat 480
 tctccaccac gggcaacgac aaggacggca cgcagaacca ccactctccg cacaagcagc 540
 acaagaaaaga gaccgtccac agcatcagtc caacctgaca tcagcgcaac aaccacaaa 600
 aacgaagaag caagtccagc gagcccacaa acatctgcaa gcacaacaag aatacaaagg 660
 aaaagcgtgg aggccaacac atcaacaaca tacaacccaa ctagttaa 708

<210> 327
 <211> 660
 <212> DNA
 <213> human metapneumo virus

<400> 327
 atggaggtga aagtagagaa cattcgagca atagacatgc tcaaagcaag agtgaaaaat 60
 cgtgtggcac gtagcaaatg ctttaaaaaat gctttctttaa tcctcatagg aataactaca 120
 ctgagtatag ctctcaatat ctatctgac ataaactaca caatacaaaa aaccacatcc 180
 gaatcagaac accacaccag ctccaccacc acagaaccca acaaggaagc ttcaacaatc 240
 tccacagaca acccagacat caatccaagc tcacagcatc caactcaaca gtccacagaa 300
 aaccccacac tcaacccgcg agcatcagcg agcccatcag aaacagaacc agcatcaaca 360
 ccagacacaa caaacgcct gtcctccgta gacaggcca cagcacaacc aagtgaagc 420
 agaacaaaaga caaacccgac agtccacaca atcaacaacc caaacacagc ttccagtaca 480
 caatccccac cagggacaac aacgaaggca atccgcagag ccaccacttt ccgcatgagc 540
 agcacaggaa aaagaccaac cacaacatta gtccagtcg acagcagcac cacaacccaa 600
 aatcatgaag aaacaggttc agcgaaccca caggcgtctg caagcacaat gcaaaaactag 660

<210> 328
 <211> 675
 <212> DNA
 <213> human metapneumo virus

<400> 328
 atggaagtaa gaggggagaa cattcgagcg atagacatgt tcaaagcaaa gataaaaaaac 60
 cgtataagaa gcagcagggtg ctatagaaat gctacactga tccttatttg actaacagcg 120
 ttaagcatgg cacttaatat tttcctgac atcgatcatg caacattaag aaacatgatc 180
 aaaacagaaa actgtgctaa catgccgtcg gcagaaccaa gcaaaaagac cccaatgacc 240
 tccacagcag gcccaaacac caaacccaat ccacagcaag caacacagtg gaccacagag 300
 aactcaacat ccccgtagc aacccagag ggccatccat acacaggagc aactcaaaca 360
 tcagacacaa cagctcccca gcaaaccaca gacaaacaca cagcaccgct aaaatcaacc 420
 aatgaacaga tccccagac aaccacagag aaaaagacaa tcagagcaac aacccaaaa 480
 agggaaaaag gaaaagaaaa cacaaccaa accacaagca cagctgcaac ccaacaacc 540
 aacaccacca accaaatcag aaatgcaagt gagacaatca caacatccga cagaccaga 600
 actgacacca caacccaaag cagcgaacag acaacccggg caacagaccc aagctcccca 660
 ccacaccatg catag 675

<210> 329
 <211> 711
 <212> DNA
 <213> human metapneumo virus

<400> 329
 atggaagtaa gaggaggagaa cattcgggca atagacatgt tcaaagcaaa aatgaaaaac 60
 cgtataagaa gtagcaagtg ctatagaaat gctacactga tccttattgg attaacagca 120
 ttaagtatgg cacttaatat ttttttaatc attgattatg caatgttaaa aaacatgacc 180
 aaagtggaac actgtgttaa tatgccgccg gtagaaccac gcaagaagac cccaatgacc 240
 tctgcagtag acttaaacac caaacccaat ccacagcagg caacacagtt ggccgcagag 300
 gattcaacat ctctagcagc aacctcagag gaccatctac acacaggagac aactccaaca 360
 ccagatgcaa cagtctctca gcaaaccaca gacgagtaca caacattgct gagatcaacc 420
 aacagacaga ccacccaaac aaccacagag aaaaagccaa ccggagcaac aacccaaaaa 480
 gaaaccacaa ctctgaactac aagcacagct gcaacccaaa cactcaacac taccaacca 540
 actagctatg tgagagaggc aaccacaaca tccgccagat ccagaaacag tgccacaact 600
 caaagcagcg accaaacaac ccaggcagca gacccaagct cccaaccaca ccatacacag 660
 aaaagcacia caacaacata caacacagac acatcctctc caagtagtta a 711

<210> 330
 <211> 2005
 <212> PRT
 <213> human metapneumo virus

<400> 330
 Met Asp Pro Leu Asn Glu Ser Thr Val Asn Val Tyr Leu Pro Asp Ser
 1 5 10 15
 Tyr Leu Lys Gly Val Ile Ser Phe Ser Glu Thr Asn Ala Ile Gly Ser
 20 25 30
 Cys Leu Leu Lys Arg Pro Tyr Leu Lys Asn Asp Asn Thr Ala Lys Val
 35 40 45
 Ala Ile Glu Asn Pro Val Ile Glu His Val Arg Leu Lys Asn Ala Val
 50 55 60
 Asn Ser Lys Met Lys Ile Ser Asp Tyr Lys Ile Val Glu Pro Val Asn
 65 70 75 80
 Met Gln His Glu Ile Met Lys Asn Val His Ser Cys Glu Leu Thr Leu
 85 90 95
 Leu Lys Gln Phe Leu Thr Arg Ser Lys Asn Ile Ser Thr Leu Lys Leu
 100 105 110
 Asn Met Ile Cys Asp Trp Leu Gln Leu Lys Ser Thr Ser Asp Asp Thr
 115 120 125
 Ser Ile Leu Ser Phe Ile Asp Val Glu Phe Ile Pro Ser Trp Val Ser
 130 135 140
 Asn Trp Phe Ser Asn Trp Tyr Asn Leu Asn Lys Leu Ile Leu Glu Phe
 145 150 155 160
 Arg Lys Glu Glu Val Ile Arg Thr Gly Ser Ile Leu Cys Arg Ser Leu
 165 170 175
 Gly Lys Leu Val Phe Val Val Ser Ser Tyr Gly Cys Ile Val Lys Ser
 180 185 190
 Asn Lys Ser Lys Arg Val Ser Phe Phe Thr Tyr Asn Gln Leu Leu Thr
 195 200 205
 Trp Lys Asp Val Met Leu Ser Arg Phe Asn Ala Asn Phe Cys Ile Trp
 210 215 220
 Val Ser Asn Ser Leu Asn Glu Asn Gln Glu Gly Leu Gly Leu Arg Ser
 225 230 235 240
 Asn Leu Gln Gly Ile Leu Thr Asn Lys Leu Tyr Glu Thr Val Asp Tyr
 245 250 255
 Met Leu Ser Leu Cys Cys Asn Glu Gly Phe Ser Leu Val Lys Glu Phe
 260 265 270
 Glu Gly Phe Ile Met Ser Glu Ile Leu Arg Ile Thr Glu His Ala Gln

NY2: 1449616.1

| | | | | | | | | | | | | | | | |
|------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Ser | Leu | Ala | Val | Lys | Met | Leu | Lys | Glu | Ile | Arg | Asp | Ala | Tyr | Arg | Asn |
| 770 | | | | | | 775 | | | | | 780 | | | | |
| Ile | Gly | His | Lys | Leu | Lys | Glu | Gly | Glu | Thr | Tyr | Ile | Ser | Arg | Asp | Leu |
| 785 | | | | | 790 | | | | | 795 | | | | | 800 |
| Gln | Phe | Ile | Ser | Lys | Val | Ile | Gln | Ser | Glu | Gly | Val | Met | His | Pro | Thr |
| | | | | 805 | | | | | 810 | | | | | 815 | |
| Pro | Ile | Lys | Lys | Ile | Leu | Arg | Val | Gly | Pro | Trp | Ile | Asn | Thr | Ile | Leu |
| | | | 820 | | | | | 825 | | | | | 830 | | |
| Asp | Asp | Ile | Lys | Thr | Ser | Ala | Glu | Ser | Ile | Gly | Ser | Leu | Cys | Gln | Glu |
| | | 835 | | | | | 840 | | | | | 845 | | | |
| Leu | Glu | Phe | Arg | Gly | Glu | Ser | Ile | Ile | Val | Ser | Leu | Ile | Leu | Arg | Asn |
| 850 | | | | | | 855 | | | | | 860 | | | | |
| Phe | Trp | Leu | Tyr | Asn | Leu | Tyr | Met | His | Glu | Ser | Lys | Gln | His | Pro | Leu |
| 865 | | | | | 870 | | | | | 875 | | | | | 880 |
| Ala | Gly | Lys | Gln | Leu | Phe | Lys | Gln | Leu | Asn | Lys | Thr | Leu | Thr | Ser | Val |
| | | | | 885 | | | | | 890 | | | | | 895 | |
| Gln | Arg | Phe | Phe | Glu | Ile | Lys | Lys | Glu | Asn | Glu | Val | Val | Asp | Leu | Trp |
| | | | 900 | | | | | 905 | | | | | 910 | | |
| Met | Asn | Ile | Pro | Met | Gln | Phe | Gly | Gly | Gly | Asp | Pro | Val | Val | Phe | Tyr |
| | | 915 | | | | | 920 | | | | | | 925 | | |
| Arg | Ser | Phe | Tyr | Arg | Arg | Thr | Pro | Asp | Phe | Leu | Thr | Glu | Ala | Ile | Ser |
| 930 | | | | | | 935 | | | | | | 940 | | | |
| His | Val | Asp | Ile | Leu | Leu | Arg | Ile | Ser | Ala | Asn | Ile | Arg | Asn | Glu | Ala |
| 945 | | | | | 950 | | | | | 955 | | | | | 960 |
| Lys | Ile | Ser | Phe | Phe | Lys | Ala | Leu | Leu | Ser | Ile | Glu | Lys | Asn | Glu | Arg |
| | | | | 965 | | | | | 970 | | | | | 975 | |
| Ala | Thr | Leu | Thr | Thr | Leu | Met | Arg | Asp | Pro | Gln | Ala | Val | Gly | Ser | Glu |
| | | | 980 | | | | | 985 | | | | | 990 | | |
| Arg | Gln | Ala | Lys | Val | Thr | Ser | Asp | Ile | Asn | Arg | Thr | Ala | Val | Thr | Ser |
| | | 995 | | | | | 1000 | | | | | 1005 | | | |
| Ile | Leu | Ser | Leu | Ser | Pro | Asn | Gln | Leu | Phe | Ser | Asp | Ser | Ala | Ile | His |
| 1010 | | | | | | 1015 | | | | | 1020 | | | | |
| Tyr | Ser | Arg | Asn | Glu | Glu | Glu | Val | Gly | Ile | Ile | Ala | Asp | Asn | Ile | Thr |
| 1025 | | | | | 1030 | | | | | 1035 | | | | | 1040 |
| Pro | Val | Tyr | Pro | His | Gly | Leu | Arg | Val | Leu | Tyr | Glu | Ser | Leu | Pro | Phe |
| | | | | 1045 | | | | | 1050 | | | | | 1055 | |
| His | Lys | Ala | Glu | Lys | Val | Val | Asn | Met | Ile | Ser | Gly | Thr | Lys | Ser | Ile |
| | | | 1060 | | | | | 1065 | | | | | 1070 | | |
| Thr | Asn | Leu | Leu | Gln | Arg | Thr | Ser | Ala | Ile | Asn | Gly | Glu | Asp | Ile | Asp |
| | | 1075 | | | | | 1080 | | | | | 1085 | | | |
| Arg | Ala | Val | Ser | Met | Met | Leu | Glu | Asn | Leu | Gly | Leu | Leu | Ser | Arg | Ile |
| 1090 | | | | | | 1095 | | | | | 1100 | | | | |
| Leu | Ser | Val | Val | Val | Asp | Ser | Ile | Glu | Ile | Pro | Thr | Lys | Ser | Asn | Gly |
| 1105 | | | | | 1110 | | | | | 1115 | | | | | 1120 |
| Arg | Leu | Ile | Cys | Cys | Gln | Ile | Ser | Arg | Thr | Leu | Arg | Glu | Thr | Ser | Trp |
| | | | | 1125 | | | | | 1130 | | | | | 1135 | |
| Asn | Asn | Met | Glu | Ile | Val | Gly | Val | Thr | Ser | Pro | Ser | Ile | Thr | Thr | Cys |
| | | 1140 | | | | | | 1145 | | | | | 1150 | | |
| Met | Asp | Val | Ile | Tyr | Ala | Thr | Ser | Ser | His | Leu | Lys | Gly | Ile | Ile | Ile |
| | | 1155 | | | | | 1160 | | | | | 1165 | | | |
| Glu | Lys | Phe | Ser | Thr | Asp | Arg | Thr | Thr | Arg | Gly | Gln | Arg | Gly | Pro | Lys |
| 1170 | | | | | | 1175 | | | | | 1180 | | | | |
| Ser | Pro | Trp | Val | Gly | Ser | Ser | Thr | Gln | Glu | Lys | Lys | Leu | Val | Pro | Val |
| 1185 | | | | | 1190 | | | | | 1195 | | | | | 1200 |
| Tyr | Asn | Arg | Gln | Ile | Leu | Ser | Lys | Gln | Gln | Arg | Glu | Gln | Leu | Glu | Ala |
| | | | | 1205 | | | | | 1210 | | | | | 1215 | |
| Ile | Gly | Lys | Met | Arg | Trp | Val | Tyr | Lys | Gly | Thr | Pro | Gly | Leu | Arg | Arg |
| | | | 1220 | | | | | 1225 | | | | | 1230 | | |
| Leu | Leu | Asn | Lys | Ile | Cys | Leu | Gly | Ser | Leu | Gly | Ile | Ser | Tyr | Lys | Cys |
| 1235 | | | | | | | 1240 | | | | | 1245 | | | |
| Val | Lys | Pro | Leu | Leu | Pro | Arg | Phe | Met | Ser | Val | Asn | Phe | Leu | His | Arg |

| | | |
|---|------|------|
| 1250 | 1255 | 1260 |
| Leu Ser Val Ser Ser Arg Pro Met Glu Phe Pro Ala Ser Val Pro Ala | | |
| 1265 | 1270 | 1275 |
| Tyr Arg Thr Thr Asn Tyr His Phe Asp Thr Ser Pro Ile Asn Gln Ala | | 1280 |
| | 1285 | 1290 |
| Leu Ser Glu Arg Phe Gly Asn Glu Asp Ile Asn Leu Val Phe Gln Asn | | 1295 |
| | 1300 | 1305 |
| Ala Ile Ser Cys Gly Ile Ser Ile Met Ser Val Val Glu Gln Leu Thr | | 1310 |
| | 1315 | 1320 |
| Gly Arg Ser Pro Lys Gln Leu Val Leu Ile Pro Gln Leu Glu Glu Ile | | 1325 |
| | 1330 | 1335 |
| Asp Ile Met Pro Pro Pro Val Phe Gln Gly Lys Phe Asn Tyr Lys Leu | | 1340 |
| 1345 | 1350 | 1355 |
| Val Asp Lys Ile Thr Ser Asp Gln His Ile Phe Ser Pro Asp Lys Ile | | 1360 |
| | 1365 | 1370 |
| Asp Met Leu Thr Leu Gly Lys Met Leu Met Pro Thr Ile Lys Gly Gln | | 1375 |
| | 1380 | 1385 |
| Lys Thr Asp Gln Phe Leu Asn Lys Arg Glu Asn Tyr Phe His Gly Asn | | 1390 |
| | 1395 | 1400 |
| Asn Leu Ile Glu Ser Leu Ser Ala Ala Leu Ala Cys His Trp Cys Gly | | 1405 |
| | 1410 | 1415 |
| Ile Leu Thr Glu Gln Cys Ile Glu Asn Asn Ile Phe Lys Lys Asp Trp | | 1420 |
| 1425 | 1430 | 1435 |
| Gly Asp Gly Phe Ile Ser Asp His Ala Phe Met Asp Phe Lys Ile Phe | | 1440 |
| | 1445 | 1450 |
| Leu Cys Val Phe Lys Thr Lys Leu Leu Cys Ser Trp Gly Ser Gln Gly | | 1455 |
| | 1460 | 1465 |
| Lys Asn Ile Lys Asp Glu Asp Ile Val Asp Glu Ser Ile Asp Lys Leu | | 1470 |
| | 1475 | 1480 |
| Leu Arg Ile Asp Asn Thr Phe Trp Arg Met Phe Ser Lys Val Met Phe | | 1485 |
| | 1490 | 1495 |
| Glu Ser Lys Val Lys Lys Arg Ile Met Leu Tyr Asp Val Lys Phe Leu | | 1500 |
| 1505 | 1510 | 1515 |
| Ser Leu Val Gly Tyr Ile Gly Phe Lys Asn Trp Phe Ile Glu Gln Leu | | 1520 |
| | 1525 | 1530 |
| Arg Ser Ala Glu Leu His Glu Val Pro Trp Ile Val Asn Ala Glu Gly | | 1535 |
| | 1540 | 1545 |
| Asp Leu Val Glu Ile Lys Ser Ile Lys Ile Tyr Leu Gln Leu Ile Glu | | 1550 |
| | 1555 | 1560 |
| Gln Ser Leu Phe Leu Arg Ile Thr Val Leu Asn Tyr Thr Asp Met Ala | | 1565 |
| | 1570 | 1575 |
| His Ala Leu Thr Arg Leu Ile Arg Lys Lys Leu Met Cys Asp Asn Ala | | 1580 |
| 1585 | 1590 | 1595 |
| Leu Leu Thr Pro Ile Pro Ser Pro Met Val Asn Leu Thr Gln Val Ile | | 1600 |
| | 1605 | 1610 |
| Asp Pro Thr Glu Gln Leu Ala Tyr Phe Pro Lys Ile Thr Phe Glu Arg | | 1615 |
| | 1620 | 1625 |
| Leu Lys Asn Tyr Asp Thr Ser Ser Asn Tyr Ala Lys Gly Lys Leu Thr | | 1630 |
| | 1635 | 1640 |
| Arg Asn Tyr Met Ile Leu Leu Pro Trp Gln His Val Asn Arg Tyr Asn | | 1645 |
| | 1650 | 1655 |
| Phe Val Phe Ser Ser Thr Gly Cys Lys Val Ser Leu Lys Thr Cys Ile | | 1660 |
| 1665 | 1670 | 1675 |
| Gly Lys Leu Met Lys Asp Leu Asn Pro Lys Val Leu Tyr Phe Ile Gly | | 1680 |
| | 1685 | 1690 |
| Glu Gly Ala Gly Asn Trp Met Ala Arg Thr Ala Cys Glu Tyr Pro Asp | | 1695 |
| | 1700 | 1705 |
| Ile Lys Phe Val Tyr Arg Ser Leu Lys Asp Asp Leu Asp His His Tyr | | 1710 |
| | 1715 | 1720 |
| Pro Leu Glu Tyr Gln Arg Val Ile Gly Glu Leu Ser Arg Ile Ile Asp | | 1725 |
| | 1730 | 1735 |
| | | 1740 |

Ser Gly Glu Gly Leu Ser Met Glu Thr Thr Asp Ala Thr Gln Lys Thr
 1745 1750 1755 1760
 His Trp Asp Leu Ile His Arg Val Ser Lys Asp Ala Leu Leu Ile Thr
 1765 1770 1775
 Leu Cys Asp Ala Glu Phe Lys Asp Arg Asp Asp Phe Phe Lys Met Val
 1780 1785 1790
 Ile Leu Trp Arg Lys His Val Leu Ser Cys Arg Ile Cys Thr Thr Tyr
 1795 1800 1805
 Gly Thr Asp Leu Tyr Leu Phe Ala Lys Tyr His Ala Lys Asp Cys Asn
 1810 1815 1820
 Val Lys Leu Pro Phe Phe Val Arg Ser Val Ala Thr Phe Ile Met Gln
 1825 1830 1835 1840
 Gly Ser Lys Leu Ser Gly Ser Glu Cys Tyr Ile Leu Leu Thr Leu Gly
 1845 1850 1855
 His His Asn Asn Leu Pro Cys His Gly Glu Ile Gln Asn Ser Lys Met
 1860 1865 1870
 Lys Ile Ala Val Cys Asn Asp Phe Tyr Ala Ala Lys Lys Leu Asp Asn
 1875 1880 1885
 Lys Ser Ile Glu Ala Asn Cys Lys Ser Leu Leu Ser Gly Leu Arg Ile
 1890 1895 1900
 Pro Ile Asn Lys Lys Glu Leu Asn Arg Gln Arg Arg Leu Leu Thr Leu
 1905 1910 1915 1920
 Gln Ser Asn His Ser Ser Val Ala Thr Val Gly Gly Ser Lys Val Ile
 1925 1930 1935
 Glu Ser Lys Trp Leu Thr Asn Lys Ala Asn Thr Ile Ile Asp Trp Leu
 1940 1945 1950
 Glu His Ile Leu Asn Ser Pro Lys Gly Glu Leu Asn Tyr Asp Phe Phe
 1955 1960 1965
 Glu Ala Leu Glu Asn Thr Tyr Pro Asn Met Ile Lys Leu Ile Asp Asn
 1970 1975 1980
 Leu Gly Asn Ala Glu Ile Lys Lys Leu Ile Lys Val Thr Gly Tyr Met
 1985 1990 1995 2000
 Leu Val Ser Lys Lys
 2005

<210> 331
 <211> 2005
 <212> PRT
 <213> human metapneumo virus

<400> 331
 Met Asp Pro Leu Asn Glu Ser Thr Val Asn Val Tyr Leu Pro Asp Ser
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 Tyr Leu Lys Gly Val Ile Ser Phe Ser Glu Thr Asn Ala Ile Gly Ser
 20 25 30
 Cys Leu Leu Lys Arg Pro Tyr Leu Lys Asn Asp Asn Thr Ala Lys Val
 35 40 45
 Ala Ile Glu Asn Pro Val Ile Glu His Val Arg Leu Lys Asn Ala Val
 50 55 60
 Asn Ser Lys Met Lys Ile Ser Asp Tyr Lys Val Val Glu Pro Val Asn
 65 70 75 80
 Met Gln His Glu Ile Met Lys Asn Val His Ser Cys Glu Leu Thr Leu
 85 90 95
 Leu Lys Gln Phe Leu Thr Arg Ser Lys Asn Ile Ser Thr Leu Lys Leu
 100 105 110
 Asn Met Ile Cys Asp Trp Leu Gln Leu Lys Ser Thr Ser Asp Asp Thr
 115 120 125
 Ser Ile Leu Ser Phe Ile Asp Val Glu Phe Ile Pro Ser Trp Val Ser
 130 135 140
 Asn Trp Phe Ser Asn Trp Tyr Asn Leu Asn Lys Leu Ile Leu Glu Phe

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 145 | Arg | Arg | Glu | Glu | Val | Ile | Arg | Thr | Gly | Ser | Ile | Leu | Cys | Arg | Ser | Leu |
| | | | | | 165 | | | | | | 170 | | | | | 175 |
| | Gly | Lys | Leu | Val | Phe | Ile | Val | Ser | Ser | Tyr | Gly | Cys | Ile | Val | Lys | Ser |
| | | | | | 180 | | | | | | 185 | | | | | 190 |
| | Asn | Lys | Ser | Lys | Arg | Val | Ser | Phe | Phe | Thr | Tyr | Asn | Gln | Leu | Leu | Thr |
| | | | | | 195 | | | | | | | | 205 | | | |
| | Trp | Lys | Asp | Val | Met | Leu | Ser | Arg | Phe | Asn | Ala | Asn | Phe | Cys | Ile | Trp |
| | | | | | | | 215 | | | | | | 220 | | | |
| | Val | Ser | Asn | Ser | Leu | Asn | Glu | Asn | Gln | Glu | Gly | Leu | Gly | Leu | Arg | Ser |
| 225 | | | | | | | 230 | | | | | 235 | | | | 240 |
| | Asn | Leu | Gln | Gly | Met | Leu | Thr | Asn | Lys | Leu | Tyr | Glu | Thr | Val | Asp | Tyr |
| | | | | | 245 | | | | | | 250 | | | | | 255 |
| | Met | Leu | Ser | Leu | Cys | Cys | Asn | Glu | Gly | Phe | Ser | Leu | Val | Lys | Glu | Phe |
| | | | | | 260 | | | | | 265 | | | | | 270 | |
| | Glu | Gly | Phe | Ile | Met | Ser | Glu | Ile | Leu | Arg | Ile | Thr | Glu | His | Ala | Gln |
| | | | | | 275 | | | | | 280 | | | | 285 | | |
| | Phe | Ser | Thr | Arg | Phe | Arg | Asn | Thr | Leu | Leu | Asn | Gly | Leu | Thr | Asp | Gln |
| | | | | | 290 | | | | | | | 300 | | | | |
| | Leu | Thr | Lys | Leu | Lys | Asn | Lys | Asn | Arg | Leu | Arg | Val | His | Gly | Thr | Val |
| 305 | | | | | | 310 | | | | | | 315 | | | | 320 |
| | Leu | Glu | Asn | Asn | Asp | Tyr | Pro | Met | Tyr | Glu | Val | Val | Leu | Lys | Leu | Leu |
| | | | | | 325 | | | | | | 330 | | | | | 335 |
| | Gly | Asp | Thr | Leu | Arg | Cys | Ile | Lys | Leu | Leu | Ile | Asn | Lys | Asn | Leu | Glu |
| | | | | | 340 | | | | | 345 | | | | 350 | | |
| | Asn | Ala | Ala | Glu | Leu | Tyr | Tyr | Ile | Phe | Arg | Ile | Phe | Gly | His | Pro | Met |
| | | | | | 355 | | | | | 360 | | | | 365 | | |
| | Val | Asp | Glu | Arg | Asp | Ala | Met | Asp | Ala | Val | Lys | Leu | Asn | Asn | Glu | Ile |
| | | | | | 370 | | | | | | | 380 | | | | |
| | Thr | Lys | Ile | Leu | Arg | Leu | Glu | Ser | Leu | Thr | Glu | Leu | Arg | Gly | Ala | Phe |
| 385 | | | | | | 390 | | | | | | 395 | | | | 400 |
| | Ile | Leu | Arg | Ile | Ile | Lys | Gly | Phe | Val | Asp | Asn | Asn | Lys | Arg | Trp | Pro |
| | | | | | 405 | | | | | 410 | | | | | | 415 |
| | Lys | Ile | Lys | Asn | Leu | Ile | Val | Leu | Ser | Lys | Arg | Trp | Thr | Met | Tyr | Phe |
| | | | | | 420 | | | | | 425 | | | | 430 | | |
| | Lys | Ala | Lys | Asn | Tyr | Pro | Ser | Gln | Leu | Glu | Leu | Ser | Glu | Gln | Asp | Phe |
| | | | | | 435 | | | | | 440 | | | | 445 | | |
| | Leu | Glu | Leu | Ala | Ala | Ile | Gln | Phe | Glu | Gln | Glu | Phe | Ser | Val | Pro | Glu |
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| | Lys | Arg | Leu | Ile | Trp | Ser | Val | Tyr | Pro | Lys | Asn | Tyr | Leu | Pro | Glu | Thr |
| | | | | | 485 | | | | | | 490 | | | | | 495 |
| | Ile | Lys | Asn | Arg | Tyr | Leu | Glu | Glu | Thr | Phe | Asn | Ala | Ser | Asp | Ser | Leu |
| | | | | | 500 | | | | | 505 | | | | 510 | | |
| | Lys | Thr | Arg | Arg | Val | Leu | Glu | Tyr | Leu | Lys | Asp | Asn | Lys | Phe | Asp | |
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| | Gln | Lys | Glu | Leu | Lys | Ser | Tyr | Val | Val | Arg | Gln | Glu | Tyr | Leu | Asn | Asp |
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| | Lys | Glu | His | Ile | Val | Ser | Leu | Thr | Gly | Lys | Glu | Arg | Glu | Leu | Ser | Val |
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| | Gly | Arg | Met | Phe | Ala | Met | Gln | Pro | Gly | Lys | Gln | Arg | Gln | Ile | Gln | Ile |
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| | Leu | Ala | Glu | Lys | Leu | Leu | Ala | Asp | Asn | Ile | Val | Pro | Phe | Phe | Pro | Glu |
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| | Thr | Leu | Thr | Lys | Tyr | Gly | Asp | Leu | Asp | Leu | Gln | Arg | Ile | Met | Glu | Ile |
| | | | | | 595 | | | | 600 | | | | | 605 | | |
| | Lys | Ser | Glu | Leu | Ser | Ser | Ile | Lys | Thr | Arg | Arg | Asn | Asp | Ser | Tyr | Asn |
| | | | | | 610 | | | | | | | 620 | | | | |
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| 625 | | | | | | 630 | | | | | 635 | | | | | 640 |

| | | | | | | | | | | | | | | | | |
|------|------|------|------|------|-----|------|-----|------|------|------|------|------|------|------|------|--|
| Gln | Ala | Phe | Arg | Tyr | Glu | Thr | Thr | Ala | Ile | Cys | Ala | Asp | Val | Ala | Asp | |
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| Glu | Leu | His | Gly | Thr | Gln | Ser | Leu | Phe | Cys | Trp | Leu | His | Leu | Ile | Val | |
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| Pro | Met | Thr | Thr | Met | Ile | Cys | Ala | Tyr | Arg | His | Ala | Pro | Pro | Glu | Thr | |
| | | 675 | | | | | 680 | | | | | 685 | | | | |
| Lys | Gly | Glu | Tyr | Asp | Ile | Asp | Lys | Ile | Glu | Glu | Gln | Ser | Gly | Leu | Tyr | |
| | 690 | | | | | 695 | | | | | 700 | | | | | |
| Arg | Tyr | His | Met | Gly | Gly | Ile | Glu | Gly | Trp | Cys | Gln | Lys | Leu | Trp | Thr | |
| 705 | | | | 710 | | | | | | 715 | | | | | 720 | |
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| Gln | Met | Thr | Ser | Leu | Leu | Asn | Gly | Asp | Asn | Gln | Ser | Ile | Asp | Val | Ser | |
| | | | 740 | | | | | 745 | | | | | 750 | | | |
| Lys | Pro | Val | Lys | Leu | Ser | Glu | Gly | Leu | Asp | Glu | Val | Lys | Ala | Asp | Tyr | |
| | 755 | | | | | | 760 | | | | | 765 | | | | |
| Arg | Leu | Ala | Ile | Lys | Met | Leu | Lys | Glu | Ile | Arg | Asp | Ala | Tyr | Arg | Asn | |
| | 770 | | | | | 775 | | | | | 780 | | | | | |
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| 785 | | | | 790 | | | | | | 795 | | | | | 800 | |
| Gln | Phe | Ile | Ser | Lys | Val | Ile | Gln | Ser | Glu | Gly | Val | Met | His | Pro | Thr | |
| | | | 805 | | | | | | 810 | | | | | 815 | | |
| Pro | Ile | Lys | Lys | Val | Leu | Arg | Val | Gly | Pro | Trp | Ile | Asn | Thr | Ile | Leu | |
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| Asp | Asp | Ile | Lys | Thr | Ser | Ala | Glu | Ser | Ile | Gly | Ser | Leu | Cys | Gln | Glu | |
| | 835 | | | | | | 840 | | | | | 845 | | | | |
| Leu | Glu | Phe | Arg | Gly | Glu | Ser | Ile | Ile | Val | Ser | Leu | Ile | Leu | Arg | Asn | |
| | 850 | | | | | 855 | | | | | 860 | | | | | |
| Phe | Trp | Leu | Tyr | Asn | Leu | Tyr | Met | His | Glu | Ser | Lys | Gln | His | Pro | Leu | |
| 865 | | | | 870 | | | | | | 875 | | | | | 880 | |
| Ala | Gly | Lys | Gln | Leu | Phe | Lys | Gln | Leu | Asn | Lys | Thr | Leu | Thr | Ser | Val | |
| | | | 885 | | | | | | 890 | | | | | 895 | | |
| Gln | Arg | Phe | Phe | Glu | Ile | Lys | Lys | Glu | Asn | Glu | Val | Val | Asp | Leu | Trp | |
| | | | 900 | | | | | 905 | | | | | 910 | | | |
| Met | Asn | Ile | Pro | Met | Gln | Phe | Gly | Gly | Gly | Asp | Pro | Val | Val | Phe | Tyr | |
| | 915 | | | | | | 920 | | | | | 925 | | | | |
| Arg | Ser | Phe | Tyr | Arg | Arg | Thr | Pro | Asp | Phe | Leu | Thr | Glu | Ala | Ile | Ser | |
| | 930 | | | | | 935 | | | | | 940 | | | | | |
| His | Val | Asp | Ile | Leu | Leu | Lys | Ile | Ser | Ala | Asn | Ile | Lys | Asn | Glu | Thr | |
| 945 | | | | 950 | | | | | | 955 | | | | | 960 | |
| Lys | Val | Ser | Phe | Phe | Lys | Ala | Leu | Leu | Ser | Ile | Glu | Lys | Asn | Glu | Arg | |
| | | | 965 | | | | | | 970 | | | | | 975 | | |
| Ala | Thr | Leu | Thr | Thr | Leu | Met | Arg | Asp | Pro | Gln | Ala | Val | Gly | Ser | Glu | |
| | | | 980 | | | | | 985 | | | | | 990 | | | |
| Arg | Gln | Ala | Lys | Val | Thr | Ser | Asp | Ile | Asn | Arg | Thr | Ala | Val | Thr | Ser | |
| | 995 | | | | | 1000 | | | | | | 1005 | | | | |
| Ile | Leu | Ser | Leu | Ser | Pro | Asn | Gln | Leu | Phe | Ser | Asp | Ser | Ala | Ile | His | |
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| Tyr | Ser | Arg | Asn | Glu | Glu | Glu | Val | Gly | Ile | Ile | Ala | Glu | Asn | Ile | Thr | |
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| Pro | Val | Tyr | Pro | His | Gly | Leu | Arg | Val | Leu | Tyr | Glu | Ser | Leu | Pro | Phe | |
| | | | 1045 | | | | | | 1050 | | | | | 1055 | | |
| His | Lys | Ala | Glu | Lys | Val | Val | Asn | Met | Ile | Ser | Gly | Thr | Lys | Ser | Ile | |
| | | 1060 | | | | | | 1065 | | | | | 1070 | | | |
| Thr | Asn | Leu | Leu | Gln | Arg | Thr | Ser | Ala | Ile | Asn | Gly | Glu | Asp | Ile | Asp | |
| | 1075 | | | | | 1080 | | | | | | 1085 | | | | |
| Arg | Ala | Val | Ser | Met | Met | Leu | Glu | Asn | Leu | Gly | Leu | Leu | Ser | Arg | Ile | |
| | 1090 | | | | | 1095 | | | | | 1100 | | | | | |
| Leu | Ser | Val | Val | Val | Asp | Ser | Ile | Glu | Ile | Pro | Ile | Lys | Ser | Asn | Gly | |
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| Arg | Leu | Ile | Cys | Cys | Gln | Ile | Ser | Arg | Thr | Leu | Arg | Glu | Thr | Ser | Trp | |

| | | | | | | | | | | | | | | | | | | |
|------|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Asn | Asn | Met | Glu | Ile | Val | Gly | Val | Thr | Ser | Pro | Ser | Ile | Thr | Thr | Cys | 1125 | 1130 | 1135 |
| | | | 1140 | | | | | 1145 | | | | | 1150 | | | | | |
| Met | Asp | Val | Ile | Tyr | Ala | Thr | Ser | Ser | His | Leu | Lys | Gly | Ile | Ile | Ile | | | |
| | | 1155 | | | | | 1160 | | | | | 1165 | | | | | | |
| Glu | Lys | Phe | Ser | Thr | Asp | Arg | Thr | Thr | Arg | Gly | Gln | Arg | Gly | Pro | Lys | | | |
| | 1170 | | | | | 1175 | | | | | 1180 | | | | | | | |
| Ser | Pro | Trp | Val | Gly | Ser | Ser | Thr | Gln | Glu | Lys | Lys | Leu | Val | Pro | Val | | | |
| 1185 | | | | | 1190 | | | | | 1195 | | | | | 1200 | | | |
| Tyr | Asn | Arg | Gln | Ile | Leu | Ser | Lys | Gln | Gln | Arg | Glu | Gln | Leu | Glu | Ala | | | |
| | | | 1205 | | | | | | 1210 | | | | | | 1215 | | | |
| Ile | Gly | Lys | Met | Arg | Trp | Val | Tyr | Lys | Gly | Thr | Pro | Gly | Leu | Arg | Arg | | | |
| | | | 1220 | | | | | 1225 | | | | | 1230 | | | | | |
| Leu | Leu | Asn | Lys | Ile | Cys | Leu | Gly | Ser | Leu | Gly | Ile | Ser | Tyr | Lys | Cys | | | |
| | | 1235 | | | | | 1240 | | | | | 1245 | | | | | | |
| Val | Lys | Pro | Leu | Leu | Pro | Arg | Phe | Met | Ser | Val | Asn | Phe | Leu | His | Arg | | | |
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| Leu | Ser | Val | Ser | Ser | Arg | Pro | Met | Glu | Phe | Pro | Ala | Ser | Val | Pro | Ala | | | |
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| Tyr | Arg | Thr | Thr | Asn | Tyr | His | Phe | Asp | Thr | Ser | Pro | Ile | Asn | Gln | Ala | | | |
| | | | 1285 | | | | | | 1290 | | | | | | 1295 | | | |
| Leu | Ser | Glu | Arg | Phe | Gly | Asn | Glu | Asp | Ile | Asn | Leu | Val | Phe | Gln | Asn | | | |
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| Ala | Ile | Ser | Cys | Gly | Ile | Ser | Ile | Met | Ser | Val | Val | Glu | Gln | Leu | Thr | | | |
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| Gly | Arg | Ser | Pro | Lys | Gln | Leu | Val | Leu | Ile | Pro | Gln | Leu | Glu | Glu | Ile | | | |
| | 1330 | | | | | 1335 | | | | | 1340 | | | | | | | |
| Asp | Ile | Met | Pro | Pro | Pro | Val | Phe | Gln | Gly | Lys | Phe | Asn | Tyr | Lys | Leu | | | |
| 1345 | | | | | 1350 | | | | | 1355 | | | | | 1360 | | | |
| Val | Asp | Lys | Ile | Thr | Ser | Asp | Gln | His | Ile | Phe | Ser | Pro | Asp | Lys | Ile | | | |
| | | | 1365 | | | | | | 1370 | | | | | 1375 | | | | |
| Asp | Met | Leu | Thr | Leu | Gly | Lys | Met | Leu | Met | Pro | Thr | Ile | Lys | Gly | Gln | | | |
| | | 1380 | | | | | | 1385 | | | | | 1390 | | | | | |
| Lys | Thr | Asp | Gln | Phe | Leu | Asn | Lys | Arg | Glu | Asn | Tyr | Phe | His | Gly | Asn | | | |
| | | 1395 | | | | | 1400 | | | | | 1405 | | | | | | |
| Asn | Leu | Ile | Glu | Ser | Leu | Ser | Ala | Ala | Leu | Ala | Cys | His | Trp | Cys | Gly | | | |
| | 1410 | | | | | 1415 | | | | | 1420 | | | | | | | |
| Ile | Leu | Thr | Glu | Gln | Cys | Ile | Glu | Asn | Asn | Ile | Phe | Lys | Lys | Asp | Trp | | | |
| 1425 | | | | | 1430 | | | | | 1435 | | | | | 1440 | | | |
| Gly | Asp | Gly | Phe | Ile | Ser | Asp | His | Ala | Phe | Met | Asp | Phe | Lys | Ile | Phe | | | |
| | | | 1445 | | | | | | 1450 | | | | 1455 | | | | | |
| Leu | Cys | Val | Phe | Lys | Thr | Lys | Leu | Leu | Cys | Ser | Trp | Gly | Ser | Gln | Gly | | | |
| | | 1460 | | | | | | 1465 | | | | | 1470 | | | | | |
| Lys | Asn | Ile | Lys | Asp | Glu | Asp | Ile | Val | Asp | Glu | Ser | Ile | Asp | Lys | Leu | | | |
| | 1475 | | | | | | 1480 | | | | | 1485 | | | | | | |
| Leu | Arg | Ile | Asp | Asn | Thr | Phe | Trp | Arg | Met | Phe | Ser | Lys | Val | Met | Phe | | | |
| | 1490 | | | | | 1495 | | | | | 1500 | | | | | | | |
| Glu | Pro | Lys | Val | Lys | Lys | Arg | Ile | Met | Leu | Tyr | Asp | Val | Lys | Phe | Leu | | | |
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| Ser | Leu | Val | Gly | Tyr | Ile | Gly | Phe | Lys | Asn | Trp | Phe | Ile | Glu | Gln | Leu | | | |
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| Arg | Ser | Ala | Glu | Leu | His | Glu | Ile | Pro | Trp | Ile | Val | Asn | Ala | Glu | Gly | | | |
| | | 1540 | | | | | | 1545 | | | | 1550 | | | | | | |
| Asp | Leu | Val | Glu | Ile | Lys | Ser | Ile | Lys | Ile | Tyr | Leu | Gln | Leu | Ile | Glu | | | |
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| Gln | Ser | Leu | Phe | Leu | Arg | Ile | Thr | Val | Leu | Asn | Tyr | Thr | Asp | Met | Ala | | | |
| | 1570 | | | | | 1575 | | | | | 1580 | | | | | | | |
| His | Ala | Leu | Thr | Arg | Leu | Ile | Arg | Lys | Lys | Leu | Met | Cys | Asp | Asn | Ala | | | |
| 1585 | | | | | 1590 | | | | | 1595 | | | | | 1600 | | | |
| Leu | Leu | Thr | Pro | Ile | Ser | Ser | Pro | Met | Val | Asn | Leu | Thr | Gln | Val | Ile | | | |
| | | | 1605 | | | | | | 1610 | | | | | 1615 | | | | |

Asp Pro Thr Thr Gln Leu Asp Tyr Phe Pro Lys Ile Thr Phe Glu Arg
 1620 1625 1630
 Leu Lys Asn Tyr Asp Thr Ser Ser Asn Tyr Ala Lys Gly Lys Leu Thr
 1635 1640 1645
 Arg Asn Tyr Met Ile Leu Leu Pro Trp Gln His Val Asn Arg Tyr Asn
 1650 1655 1660
 Phe Val Phe Ser Ser Thr Gly Cys Lys Val Ser Leu Lys Thr Cys Ile
 1665 1670 1675 1680
 Gly Lys Leu Met Lys Asp Leu Asn Pro Lys Val Leu Tyr Phe Ile Gly
 1685 1690 1695
 Glu Gly Ala Gly Asn Trp Met Ala Arg Thr Ala Cys Glu Tyr Pro Asp
 1700 1705 1710
 Ile Lys Phe Val Tyr Arg Ser Leu Lys Asp Asp Leu Asp His His Tyr
 1715 1720 1725
 Pro Leu Glu Tyr Gln Arg Val Ile Gly Glu Leu Ser Arg Ile Ile Asp
 1730 1735 1740
 Ser Gly Glu Gly Leu Ser Met Glu Thr Thr Asp Ala Thr Gln Lys Thr
 1745 1750 1755 1760
 His Trp Asp Leu Ile His Arg Val Ser Lys Asp Ala Leu Leu Ile Thr
 1765 1770 1775
 Leu Cys Asp Ala Glu Phe Lys Asp Arg Asp Asp Phe Phe Lys Met Val
 1780 1785 1790
 Ile Leu Trp Arg Lys His Val Leu Ser Cys Arg Ile Cys Thr Thr Tyr
 1795 1800 1805
 Gly Thr Asp Leu Tyr Leu Phe Ala Lys Tyr His Ala Lys Asp Cys Asn
 1810 1815 1820
 Val Lys Leu Pro Phe Phe Val Arg Ser Val Ala Thr Phe Ile Met Gln
 1825 1830 1835 1840
 Gly Ser Lys Leu Ser Gly Ser Glu Cys Tyr Ile Leu Leu Thr Leu Gly
 1845 1850 1855
 His His Asn Ser Leu Pro Cys His Gly Glu Ile Gln Asn Ser Lys Met
 1860 1865 1870
 Lys Ile Ala Val Cys Asn Asp Phe Tyr Ala Ala Lys Lys Leu Asp Asn
 1875 1880 1885
 Lys Ser Ile Glu Ala Asn Cys Lys Ser Leu Leu Ser Gly Leu Arg Ile
 1890 1895 1900
 Pro Ile Asn Lys Lys Glu Leu Asp Arg Gln Arg Arg Leu Leu Thr Leu
 1905 1910 1915 1920
 Gln Ser Asn His Ser Ser Val Ala Thr Val Gly Gly Ser Lys Ile Ile
 1925 1930 1935
 Glu Ser Lys Trp Leu Thr Asn Lys Ala Ser Thr Ile Ile Asp Trp Leu
 1940 1945 1950
 Glu His Ile Leu Asn Ser Pro Lys Gly Glu Leu Asn Tyr Asp Phe Phe
 1955 1960 1965
 Glu Ala Leu Glu Asn Thr Tyr Pro Asn Met Ile Lys Leu Ile Asp Asn
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 Leu Gly Asn Ala Glu Ile Lys Lys Leu Ile Lys Val Thr Gly Tyr Met
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 2005

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<400> 332

Met Asp Pro Phe Cys Glu Ser Thr Val Asn Val Tyr Leu Pro Asp Ser
 1 5 10 15
 Tyr Leu Lys Gly Val Ile Ser Phe Ser Glu Thr Asn Ala Ile Gly Ser

NY2: 1449616.1

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Arg | Thr | Arg | Arg | Val | Leu | Glu | Phe | Tyr | Leu | Lys | Asp | Cys | Lys | Phe | Asp |
| | | 515 | | | | | 520 | | | | | 525 | | | |
| Gln | Lys | Glu | Leu | Lys | Arg | Tyr | Val | Ile | Lys | Gln | Glu | Tyr | Leu | Asn | Asp |
| | 530 | | | | | 535 | | | | | 540 | | | | |
| Lys | Asp | His | Ile | Val | Ser | Leu | Thr | Gly | Lys | Glu | Arg | Glu | Leu | Ser | Val |
| 545 | | | | | 550 | | | | | 555 | | | | | 560 |
| Gly | Arg | Met | Phe | Ala | Met | Gln | Pro | Gly | Lys | Gln | Arg | Gln | Ile | Gln | Ile |
| | | | | 565 | | | | | 570 | | | | | 575 | |
| Leu | Ala | Glu | Lys | Leu | Leu | Ala | Asp | Asn | Ile | Val | Pro | Phe | Phe | Pro | Glu |
| | | | 580 | | | | | 585 | | | | | 590 | | |
| Thr | Leu | Thr | Lys | Tyr | Gly | Asp | Leu | Asp | Leu | Gln | Arg | Ile | Met | Glu | Ile |
| | | 595 | | | | 600 | | | | | | 605 | | | |
| Lys | Ser | Glu | Leu | Ser | Ser | Ile | Lys | Thr | Arg | Lys | Asn | Asp | Ser | Tyr | Asn |
| | 610 | | | | | 615 | | | | | 620 | | | | |
| Asn | Tyr | Ile | Ala | Arg | Ala | Ser | Ile | Val | Thr | Asp | Leu | Ser | Lys | Phe | Asn |
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| Gln | Ala | Phe | Arg | Tyr | Glu | Thr | Thr | Ala | Ile | Cys | Ala | Asp | Val | Ala | Asp |
| | | | | 645 | | | | | 650 | | | | | 655 | |
| Glu | Leu | His | Gly | Thr | Gln | Ser | Leu | Phe | Cys | Trp | Leu | His | Leu | Ile | Val |
| | | | 660 | | | | | 665 | | | | | 670 | | |
| Pro | Met | Thr | Thr | Met | Ile | Cys | Ala | Tyr | Arg | His | Ala | Pro | Pro | Glu | Thr |
| | | 675 | | | | | 680 | | | | | 685 | | | |
| Lys | Gly | Glu | Tyr | Asp | Ile | Asp | Lys | Ile | Gln | Glu | Gln | Ser | Gly | Leu | Tyr |
| | 690 | | | | | 695 | | | | | 700 | | | | |
| Arg | Tyr | His | Met | Gly | Gly | Ile | Glu | Gly | Trp | Cys | Gln | Lys | Leu | Trp | Thr |
| 705 | | | | | 710 | | | | | 715 | | | | | 720 |
| Met | Glu | Ala | Ile | Ser | Leu | Leu | Asp | Val | Val | Ser | Val | Lys | Thr | Arg | Cys |
| | | | | 725 | | | | 730 | | | | | | 735 | |
| Gln | Met | Thr | Ser | Leu | Leu | Asn | Gly | Asp | Asn | Gln | Ser | Ile | Asp | Val | Ser |
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| Lys | Pro | Val | Lys | Leu | Ser | Glu | Gly | Ile | Asp | Glu | Val | Lys | Ala | Asp | Tyr |
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| Ser | Leu | Ala | Ile | Arg | Met | Leu | Lys | Glu | Ile | Arg | Asp | Ala | Tyr | Lys | Asn |
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| Gln | Phe | Ile | Ser | Lys | Val | Ile | Gln | Ser | Glu | Gly | Val | Met | His | Pro | Thr |
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| Asp | Asp | Ile | Lys | Thr | Ser | Ala | Glu | Ser | Ile | Gly | Ser | Leu | Cys | Gln | Glu |
| | | 835 | | | | | 840 | | | | | 845 | | | |
| Leu | Glu | Phe | Arg | Gly | Glu | Ser | Ile | Leu | Val | Ser | Leu | Ile | Leu | Arg | Asn |
| | 850 | | | | | 855 | | | | | 860 | | | | |
| Phe | Trp | Leu | Tyr | Asn | Leu | Tyr | Met | Tyr | Glu | Ser | Lys | Gln | His | Pro | Leu |
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| Ala | Gly | Lys | Gln | Leu | Phe | Lys | Gln | Leu | Asn | Lys | Thr | Leu | Thr | Ser | Val |
| | | | | 885 | | | | | 890 | | | | | 895 | |
| Gln | Arg | Phe | Phe | Glu | Leu | Lys | Lys | Glu | Asn | Asp | Val | Val | Asp | Leu | Trp |
| | | | 900 | | | | | 905 | | | | | 910 | | |
| Met | Asn | Ile | Pro | Met | Gln | Phe | Gly | Gly | Gly | Asp | Pro | Val | Val | Phe | Tyr |
| | | 915 | | | | | 920 | | | | | 925 | | | |
| Arg | Ser | Phe | Tyr | Arg | Arg | Thr | Pro | Asp | Phe | Leu | Thr | Glu | Ala | Ile | Ser |
| | 930 | | | | | 935 | | | | | 940 | | | | |
| His | Val | Asp | Leu | Leu | Leu | Lys | Val | Ser | Asn | Asn | Ile | Lys | Asp | Glu | Thr |
| 945 | | | | | 950 | | | | | 955 | | | | | 960 |
| Lys | Ile | Arg | Phe | Phe | Lys | Ala | Leu | Leu | Ser | Ile | Glu | Lys | Asn | Glu | Arg |
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| Ala | Thr | Leu | Thr | Thr | Leu | Met | Arg | Asp | Pro | Gln | Ala | Val | Gly | Ser | Glu |
| | | | 980 | | | | | 985 | | | | | 990 | | |
| Arg | Gln | Ala | Lys | Val | Thr | Ser | Asp | Ile | Asn | Arg | Thr | Ala | Val | Thr | Ser |

| | | |
|---|------|------|
| 995 | 1000 | 1005 |
| Ile Leu Ser Leu Ser Pro Asn Gln Leu Phe Cys Asp Ser Ala Ile His | | |
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| Pro Val Tyr Pro His Gly Leu Arg Val Leu Tyr Glu Ser Leu Pro Phe | | 1040 |
| | 1045 | 1050 |
| His Lys Ala Glu Lys Val Val Asn Met Ile Ser Gly Thr Lys Ser Ile | | 1055 |
| | 1060 | 1065 |
| Thr Asn Leu Leu Gln Arg Thr Ser Ala Ile Asn Gly Glu Asp Ile Asp | | 1070 |
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| Arg Ala Val Ser Met Met Leu Glu Asn Leu Gly Leu Leu Ser Arg Ile | | 1085 |
| | 1090 | 1095 |
| Leu Ser Val Ile Ile Asn Ser Ile Glu Ile Pro Ile Lys Ser Asn Gly | | 1100 |
| 1105 | 1110 | 1115 |
| Arg Leu Ile Cys Cys Gln Ile Ser Lys Thr Leu Arg Glu Lys Ser Trp | | 1120 |
| | 1125 | 1130 |
| Asn Asn Met Glu Ile Val Gly Val Thr Ser Pro Ser Ile Val Thr Cys | | 1135 |
| | 1140 | 1145 |
| Met Asp Val Val Tyr Ala Thr Ser Ser His Leu Lys Gly Ile Ile Ile | | 1150 |
| | 1155 | 1160 |
| Glu Lys Phe Ser Thr Asp Lys Thr Thr Arg Gly Gln Arg Gly Pro Lys | | 1165 |
| | 1170 | 1175 |
| Ser Pro Trp Val Gly Ser Ser Thr Gln Glu Lys Lys Leu Val Pro Val | | 1180 |
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| Tyr Asn Arg Gln Ile Leu Ser Lys Gln Gln Lys Glu Gln Leu Glu Ala | | 1200 |
| | 1205 | 1210 |
| Ile Gly Lys Met Arg Trp Val Tyr Lys Gly Thr Pro Gly Leu Arg Arg | | 1215 |
| | 1220 | 1225 |
| Leu Leu Asn Lys Ile Cys Ile Gly Ser Leu Gly Ile Ser Tyr Lys Cys | | 1230 |
| | 1235 | 1240 |
| Val Lys Pro Leu Leu Pro Arg Phe Met Ser Val Asn Phe Leu His Arg | | 1245 |
| | 1250 | 1255 |
| Leu Ser Val Ser Ser Arg Pro Met Glu Phe Pro Ala Ser Val Pro Ala | | 1260 |
| 1265 | 1270 | 1275 |
| Tyr Arg Thr Thr Asn Tyr His Phe Asp Thr Ser Pro Ile Asn Gln Ala | | 1280 |
| | 1285 | 1290 |
| Leu Ser Glu Arg Phe Gly Asn Glu Asp Ile Asn Leu Val Phe Gln Asn | | 1295 |
| | 1300 | 1305 |
| Ala Ile Ser Cys Gly Ile Ser Ile Met Ser Val Val Glu Gln Leu Thr | | 1310 |
| | 1315 | 1320 |
| Gly Arg Ser Pro Lys Gln Leu Val Leu Ile Pro Gln Leu Glu Glu Ile | | 1325 |
| | 1330 | 1335 |
| Asp Ile Met Pro Pro Pro Val Phe Gln Gly Lys Phe Asn Tyr Lys Leu | | 1340 |
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| Val Asp Lys Ile Thr Ser Asp Gln His Ile Phe Ser Pro Asp Lys Ile | | 1360 |
| | 1365 | 1370 |
| Asp Ile Leu Thr Leu Gly Lys Met Leu Met Pro Thr Ile Lys Gly Gln | | 1375 |
| | 1380 | 1385 |
| Lys Thr Asp Gln Phe Leu Asn Lys Arg Glu Asn Tyr Phe His Gly Asn | | 1390 |
| | 1395 | 1400 |
| Asn Leu Ile Glu Ser Leu Ser Ala Ala Leu Ala Cys His Trp Cys Gly | | 1405 |
| | 1410 | 1415 |
| Ile Leu Thr Glu Gln Cys Ile Glu Asn Asn Ile Phe Arg Lys Asp Trp | | 1420 |
| 1425 | 1430 | 1435 |
| Gly Asp Gly Phe Ile Ser Asp His Ala Phe Met Asp Phe Lys Val Phe | | 1440 |
| | 1445 | 1450 |
| Leu Cys Val Phe Lys Thr Lys Leu Leu Cys Ser Trp Gly Ser Gln Gly | | 1455 |
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| Lys Asn Val Lys Asp Glu Asp Ile Ile Asp Glu Ser Ile Asp Lys Leu | | 1470 |
| | 1475 | 1480 |
| | | 1485 |

NY2: 1449616.1

| | | | | |
|---|--|------|--|------|
| 1970 | | 1975 | | 1980 |
| Leu Gly Asn Ala Glu Ile Lys Lys Leu Ile Lys Val Thr Gly Tyr Met | | | | |
| 1985 | | 1990 | | 1995 |
| Leu Val Ser Lys Lys | | | | 2000 |
| | | 2005 | | |

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 <211> 2005
 <212> PRT
 <213> human metapneumo virus

<400> 333

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| Met Asp Pro Phe Cys Glu Ser Thr Val Asn Val Tyr Leu Pro Asp Ser | | | | | | | | | | | | | | | | | | | |
| 1 | | | | 5 | | | | | 10 | | | | | | 15 | | | | |
| Tyr Leu Lys Gly Val Ile Ser Phe Ser Glu Thr Asn Ala Ile Gly Ser | | | | | | | | | | | | | | | | | | | |
| | | | 20 | | | | | 25 | | | | | | 30 | | | | | |
| Cys Leu Leu Lys Arg Pro Tyr Leu Lys Lys Asp Asn Thr Ala Lys Val | | | | | | | | | | | | | | | | | | | |
| | | 35 | | | | | 40 | | | | | | 45 | | | | | | |
| Ala Val Glu Asn Pro Val Val Glu His Val Arg Leu Arg Asn Ala Val | | | | | | | | | | | | | | | | | | | |
| | 50 | | | | | 55 | | | | | | 60 | | | | | | | |
| Met Thr Lys Met Lys Ile Ser Asp Tyr Lys Val Val Glu Pro Ile Asn | | | | | | | | | | | | | | | | | | | |
| 65 | | | | | 70 | | | | 75 | | | | | | | | | | 80 |
| Met Gln His Glu Ile Met Lys Asn Ile His Ser Cys Glu Leu Thr Leu | | | | | | | | | | | | | | | | | | | |
| | | | | 85 | | | | 90 | | | | | | | | | | | 95 |
| Leu Lys Gln Phe Leu Thr Arg Ser Lys Asn Ile Ser Ser Leu Lys Leu | | | | | | | | | | | | | | | | | | | |
| | | | 100 | | | | | 105 | | | | | | | | | | | 110 |
| Ser Met Ile Cys Asp Trp Leu Gln Leu Lys Ser Thr Ser Asp Asn Thr | | | | | | | | | | | | | | | | | | | |
| | | 115 | | | | | 120 | | | | | | | | | | | | 125 |
| Ser Ile Leu Asn Phe Ile Asp Val Glu Phe Ile Pro Val Trp Val Ser | | | | | | | | | | | | | | | | | | | |
| | 130 | | | | | 135 | | | | | | | | 140 | | | | | |
| Asn Trp Phe Ser Asn Trp Tyr Asn Leu Asn Lys Leu Ile Leu Glu Phe | | | | | | | | | | | | | | | | | | | |
| 145 | | | | | 150 | | | | 155 | | | | | | | | | | 160 |
| Arg Arg Glu Glu Val Ile Arg Thr Gly Ser Ile Leu Cys Arg Ser Leu | | | | | | | | | | | | | | | | | | | |
| | | | | 165 | | | | | 170 | | | | | | | | | | 175 |
| Gly Lys Leu Val Phe Ile Val Ser Ser Tyr Gly Cys Val Val Lys Ser | | | | | | | | | | | | | | | | | | | |
| | | | 180 | | | | | 185 | | | | | | | | | | | 190 |
| Asn Lys Ser Lys Arg Val Ser Phe Phe Thr Tyr Asn Gln Leu Leu Thr | | | | | | | | | | | | | | | | | | | |
| | | 195 | | | | | 200 | | | | | | | | | | | | 205 |
| Trp Lys Asp Val Met Leu Ser Arg Phe Asn Ala Asn Phe Cys Ile Trp | | | | | | | | | | | | | | | | | | | |
| | 210 | | | | | | 215 | | | | | | | | | | | | 220 |
| Val Ser Asn Asn Leu Asn Lys Asn Gln Glu Gly Leu Gly Phe Arg Ser | | | | | | | | | | | | | | | | | | | |
| 225 | | | | | 230 | | | | 235 | | | | | | | | | | 240 |
| Asn Leu Gln Gly Met Leu Thr Asn Lys Leu Tyr Glu Thr Val Asp Tyr | | | | | | | | | | | | | | | | | | | |
| | | | | 245 | | | | | 250 | | | | | | | | | | 255 |
| Met Leu Ser Leu Cys Ser Asn Glu Gly Phe Ser Leu Val Lys Glu Phe | | | | | | | | | | | | | | | | | | | |
| | | | 260 | | | | | 265 | | | | | | | | | | | 270 |
| Glu Gly Phe Ile Met Ser Glu Ile Leu Lys Ile Thr Glu His Ala Gln | | | | | | | | | | | | | | | | | | | |
| | | 275 | | | | | 280 | | | | | | | | | | | | 285 |
| Phe Ser Thr Arg Phe Arg Asn Thr Leu Leu Asn Gly Leu Thr Glu Gln | | | | | | | | | | | | | | | | | | | |
| | 290 | | | | | | 295 | | | | | | | | | | | | 300 |
| Leu Ser Met Leu Lys Ala Lys Asn Arg Ser Arg Val Leu Gly Thr Ile | | | | | | | | | | | | | | | | | | | |
| 305 | | | | | 310 | | | | 315 | | | | | | | | | | 320 |
| Leu Glu Asn Asn Asp Tyr Pro Met Tyr Glu Val Val Leu Lys Leu Leu | | | | | | | | | | | | | | | | | | | |
| | | | | 325 | | | | | 330 | | | | | | | | | | 335 |
| Gly Asp Thr Leu Lys Ser Ile Lys Leu Leu Ile Asn Lys Asn Leu Glu | | | | | | | | | | | | | | | | | | | |
| | | | 340 | | | | | 345 | | | | | | | | | | | 350 |
| Asn Ala Ala Glu Leu Tyr Tyr Ile Phe Arg Ile Phe Gly His Pro Met | | | | | | | | | | | | | | | | | | | |
| | 355 | | | | | | 360 | | | | | | | | | | | | 365 |
| Val Asp Glu Arg Glu Ala Met Asp Ala Val Lys Leu Asn Asn Glu Ile | | | | | | | | | | | | | | | | | | | |
| | 370 | | | | | | 375 | | | | | | | | | | | | 380 |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Thr | Lys | Ile | Leu | Lys | Leu | Glu | Ser | Leu | Thr | Glu | Leu | Arg | Gly | Ala | Phe |
| 385 | | | | | 390 | | | | | 395 | | | | | 400 |
| Ile | Leu | Arg | Ile | Ile | Lys | Gly | Phe | Val | Asp | Asn | Asn | Lys | Arg | Trp | Pro |
| | | | | 405 | | | | | 410 | | | | | 415 | |
| Lys | Ile | Lys | Asn | Leu | Lys | Val | Leu | Ser | Lys | Arg | Trp | Val | Met | Tyr | Phe |
| | | | 420 | | | | | 425 | | | | | 430 | | |
| Lys | Ala | Lys | Ser | Tyr | Pro | Ser | Gln | Leu | Glu | Leu | Ser | Val | Gln | Asp | Phe |
| | | 435 | | | | | 440 | | | | | 445 | | | |
| Leu | Glu | Leu | Ala | Ala | Val | Gln | Phe | Glu | Gln | Glu | Phe | Ser | Val | Pro | Glu |
| | 450 | | | | | 455 | | | | | 460 | | | | |
| Lys | Thr | Asn | Leu | Glu | Met | Val | Leu | Asn | Asp | Lys | Ala | Ile | Ser | Pro | Pro |
| 465 | | | | | 470 | | | | | 475 | | | | | 480 |
| Lys | Lys | Leu | Ile | Trp | Ser | Val | Tyr | Pro | Lys | Asn | Tyr | Leu | Pro | Glu | Ile |
| | | | 485 | | | | | | 490 | | | | | 495 | |
| Ile | Lys | Asn | Gln | Tyr | Leu | Glu | Glu | Val | Phe | Asn | Ala | Ser | Asp | Ser | Gln |
| | | | 500 | | | | | 505 | | | | | 510 | | |
| Arg | Thr | Arg | Arg | Val | Leu | Glu | Phe | Tyr | Leu | Lys | Asp | Cys | Lys | Phe | Asp |
| | | 515 | | | | | 520 | | | | | 525 | | | |
| Gln | Lys | Asp | Leu | Lys | Arg | Tyr | Val | Leu | Lys | Gln | Glu | Tyr | Leu | Asn | Asp |
| | 530 | | | | | 535 | | | | | 540 | | | | |
| Lys | Asp | His | Ile | Val | Ser | Leu | Thr | Gly | Lys | Glu | Arg | Glu | Leu | Ser | Val |
| 545 | | | | | 550 | | | | | 555 | | | | | 560 |
| Gly | Arg | Met | Phe | Ala | Met | Gln | Pro | Gly | Lys | Gln | Arg | Gln | Ile | Gln | Ile |
| | | | 565 | | | | | | 570 | | | | | 575 | |
| Leu | Ala | Glu | Lys | Leu | Leu | Ala | Asp | Asn | Ile | Val | Pro | Phe | Phe | Pro | Glu |
| | | | 580 | | | | 585 | | | | | | 590 | | |
| Thr | Leu | Thr | Lys | Tyr | Gly | Asp | Leu | Asp | Leu | Gln | Arg | Ile | Met | Glu | Met |
| | | 595 | | | | | 600 | | | | | | 605 | | |
| Lys | Ser | Glu | Leu | Ser | Ser | Ile | Lys | Thr | Arg | Lys | Asn | Asp | Ser | Tyr | Asn |
| | 610 | | | | | 615 | | | | | 620 | | | | |
| Asn | Tyr | Ile | Ala | Arg | Ala | Ser | Ile | Val | Thr | Asp | Leu | Ser | Lys | Phe | Asn |
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| Gln | Ala | Phe | Arg | Tyr | Glu | Thr | Thr | Ala | Ile | Cys | Ala | Asp | Val | Ala | Asp |
| | | | 645 | | | | | | 650 | | | | | 655 | |
| Glu | Leu | His | Gly | Thr | Gln | Ser | Leu | Phe | Cys | Trp | Leu | His | Leu | Ile | Val |
| | | | 660 | | | | | 665 | | | | | 670 | | |
| Pro | Met | Thr | Thr | Met | Ile | Cys | Ala | Tyr | Arg | His | Ala | Pro | Pro | Glu | Thr |
| | | 675 | | | | | 680 | | | | | 685 | | | |
| Lys | Gly | Glu | Tyr | Asp | Ile | Asp | Lys | Ile | Glu | Glu | Gln | Ser | Gly | Leu | Tyr |
| | 690 | | | | | 695 | | | | | 700 | | | | |
| Arg | Tyr | His | Met | Gly | Gly | Ile | Glu | Gly | Trp | Cys | Gln | Lys | Leu | Trp | Thr |
| 705 | | | | | 710 | | | | | 715 | | | | | 720 |
| Met | Glu | Ala | Ile | Ser | Leu | Leu | Asp | Val | Val | Ser | Val | Lys | Thr | Arg | Cys |
| | | | 725 | | | | | | 730 | | | | | 735 | |
| Gln | Met | Thr | Ser | Leu | Leu | Asn | Gly | Asp | Asn | Gln | Ser | Ile | Asp | Val | Ser |
| | | | 740 | | | | | 745 | | | | | 750 | | |
| Lys | Pro | Val | Lys | Leu | Ser | Glu | Gly | Ile | Asp | Glu | Val | Lys | Ala | Asp | Tyr |
| | | 755 | | | | | 760 | | | | | 765 | | | |
| Ser | Leu | Ala | Ile | Lys | Met | Leu | Lys | Glu | Ile | Arg | Asp | Ala | Tyr | Lys | Asn |
| | 770 | | | | | 775 | | | | | 780 | | | | |
| Ile | Gly | His | Lys | Leu | Lys | Glu | Gly | Glu | Thr | Tyr | Ile | Ser | Arg | Asp | Leu |
| 785 | | | | | 790 | | | | | 795 | | | | | 800 |
| Gln | Phe | Ile | Ser | Lys | Val | Ile | Gln | Ser | Glu | Gly | Val | Met | His | Pro | Thr |
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| Pro | Ile | Lys | Lys | Ile | Leu | Arg | Val | Gly | Pro | Trp | Ile | Asn | Thr | Ile | Leu |
| | | | 820 | | | | | 825 | | | | | 830 | | |
| Asp | Asp | Ile | Lys | Thr | Ser | Ala | Glu | Ser | Ile | Gly | Ser | Leu | Cys | Gln | Glu |
| | | 835 | | | | | 840 | | | | | 845 | | | |
| Leu | Glu | Phe | Arg | Gly | Glu | Ser | Met | Leu | Val | Ser | Leu | Ile | Leu | Arg | Asn |
| | 850 | | | | | 855 | | | | | 860 | | | | |
| Phe | Trp | Leu | Tyr | Asn | Leu | Tyr | Met | His | Glu | Ser | Lys | Gln | His | Pro | Leu |

| | | | | | | | | | | | | | | |
|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|---------|
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| Ala | Gly | Lys | Gln | Leu | Phe | Lys | Gln | Leu | Asn | Lys | Thr | Leu | Thr | Ser Val |
| | | | | 885 | | | | | 890 | | | | | 895 |
| Gln | Arg | Phe | Phe | Glu | Leu | Lys | Lys | Glu | Asn | Asp | Val | Val | Asp | Leu Trp |
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| Met | Asn | Ile | Pro | Met | Gln | Phe | Gly | Gly | Gly | Asp | Pro | Val | Val | Phe Tyr |
| | 915 | | | | | | 920 | | | | | 925 | | |
| Arg | Ser | Phe | Tyr | Arg | Arg | Thr | Pro | Asp | Phe | Leu | Thr | Glu | Ala | Ile Ser |
| | 930 | | | | | 935 | | | | | 940 | | | |
| His | Val | Asp | Leu | Leu | Leu | Lys | Val | Ser | Asn | Asn | Ile | Lys | Asn | Glu Thr |
| 945 | | | | 950 | | | | | 955 | | | | | 960 |
| Lys | Ile | Arg | Phe | Phe | Lys | Ala | Leu | Leu | Ser | Ile | Glu | Lys | Asn | Glu Arg |
| | | | 965 | | | | | | 970 | | | | | 975 |
| Ala | Thr | Leu | Thr | Thr | Leu | Met | Arg | Asp | Pro | Gln | Ala | Val | Gly | Ser Glu |
| | | 980 | | | | | | 985 | | | | | 990 | |
| Arg | Gln | Ala | Lys | Val | Thr | Ser | Asp | Ile | Asn | Arg | Thr | Ala | Val | Thr Ser |
| | 995 | | | | | | 1000 | | | | | 1005 | | |
| Ile | Leu | Ser | Leu | Ser | Pro | Asn | Gln | Leu | Phe | Cys | Asp | Ser | Ala | Ile His |
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| Tyr | Ser | Arg | Asn | Glu | Glu | Val | Gly | Ile | Ile | Ala | Asp | Asn | Ile | Thr |
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| Pro | Val | Tyr | Pro | His | Gly | Leu | Arg | Val | Leu | Tyr | Glu | Ser | Leu | Pro Phe |
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| His | Lys | Ala | Glu | Lys | Val | Val | Asn | Met | Ile | Ser | Gly | Thr | Lys | Ser Ile |
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| Arg | Leu | Ile | Cys | Cys | Gln | Ile | Ser | Lys | Thr | Leu | Arg | Glu | Lys | Ser Trp |
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| Asn | Asn | Met | Glu | Ile | Val | Gly | Val | Thr | Ser | Pro | Ser | Ile | Val | Thr Cys |
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| Met | Asp | Val | Val | Tyr | Ala | Thr | Ser | Ser | His | Leu | Lys | Gly | Ile | Ile Ile |
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| Glu | Lys | Phe | Ser | Thr | Asp | Lys | Thr | Thr | Arg | Gly | Gln | Arg | Gly | Pro Lys |
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| Ser | Pro | Trp | Val | Gly | Ser | Ser | Thr | Gln | Glu | Lys | Lys | Leu | Val | Pro Val |
| 1185 | | | 1190 | | | | | 1195 | | | | | | 1200 |
| Tyr | Asn | Arg | Gln | Ile | Leu | Ser | Lys | Gln | Gln | Lys | Glu | Gln | Leu | Glu Ala |
| | | | 1205 | | | | | 1210 | | | | | | 1215 |
| Ile | Gly | Lys | Met | Arg | Trp | Val | Tyr | Lys | Gly | Thr | Pro | Gly | Leu | Arg Arg |
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| Leu | Leu | Asn | Lys | Ile | Cys | Ile | Gly | Ser | Leu | Gly | Ile | Ser | Tyr | Lys Cys |
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| Val | Lys | Pro | Leu | Leu | Pro | Arg | Phe | Met | Ser | Val | Asn | Phe | Leu | His Arg |
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| Tyr | Arg | Thr | Thr | Asn | Tyr | His | Phe | Asp | Thr | Ser | Pro | Ile | Asn | Gln Ala |
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| Leu | Ser | Glu | Arg | Phe | Gly | Asn | Glu | Asp | Ile | Asn | Leu | Val | Phe | Gln Asn |
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| Ala | Ile | Ser | Cys | Gly | Ile | Ser | Ile | Met | Ser | Val | Val | Glu | Gln | Leu Thr |
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| Gly | Arg | Ser | Pro | Lys | Gln | Leu | Val | Leu | Ile | Pro | Gln | Leu | Glu | Glu Ile |
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| Asp | Ile | Met | Pro | Pro | Pro | Val | Phe | Gln | Gly | Lys | Phe | Asn | Tyr | Lys Leu |
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| | | | | | | |
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<210> 337

<211> 6018

<212> DNA

<213> human metapneumo virus

<400> 337

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| aaaaaagata | acactgctaa | agttgctgta | gaaaaccctg | ttgttgaaca | gtcaggctt | 180 |
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| ttacaagaa | gtaaaaacat | tagctctcta | aaattaagta | tgatatgtga | ttgggttacag | 360 |
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| aatctgcaag | gtatgttaac | caataaatta | tatgaaactg | ttgattatat | gttaagtcta | 780 |
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<210> 338
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 <212> PRT
 <213> human metapneumo virus

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35      40      45
Asn Thr Asp Arg Ala Asp Gly Leu Ser Ile Ile Ser Gly Ala Gly Arg
50      55      60
Glu Asp Arg Thr Gln Asp Phe Val Leu Gly Ser Thr Asn Val Val Gln
65      70      75      80
Gly Tyr Ile Asp Asp Asn Gln Ser Ile Thr Lys Ala Ala Ala Cys Tyr
85      90      95
Ser Leu His Asn Ile Ile Lys Gln Leu Gln Glu Val Glu Val Arg Gln
100     105     110
Ala Arg Asp Asn Lys Leu Ser Asp Ser Lys His Val Ala Leu His Asn
115     120     125
Leu Val Leu Ser Tyr Met Glu Met Ser Lys Thr Pro Ala Ser Leu Ile
130     135     140
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| Leu | Gln | Asp | Ser | Glu | Ser | Thr | Asn | Gln | Val | Gln | | | | | |
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<210> 339
 <211> 187
 <212> PRT
 <213> human metapneumo virus

<400> 339

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| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Arg | Gly | Ser | Glu | Cys | Lys | Phe | Asn | His | Asn | Tyr | Trp | Ser | Trp | Pro | Asp |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Arg | Tyr | Leu | Leu | Ile | Arg | Ser | Asn | Tyr | Leu | Leu | Asn | Gln | Leu | Leu | Arg |
| | | | 35 | | | | 40 | | | | | 45 | | | |
| Asn | Thr | Asp | Arg | Ala | Asp | Gly | Leu | Ser | Ile | Ile | Ser | Gly | Ala | Gly | Arg |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Glu | Asp | Arg | Thr | Gln | Asp | Phe | Val | Leu | Gly | Ser | Thr | Asn | Val | Val | Gln |
| 65 | | | | 70 | | | | | | 75 | | | | | 80 |
| Gly | Tyr | Ile | Asp | Asp | Asn | Gln | Ser | Ile | Thr | Lys | Ala | Ala | Ala | Cys | Tyr |
| | | | 85 | | | | | 90 | | | | | | 95 | |
| Ser | Leu | His | Asn | Ile | Ile | Lys | Gln | Leu | Gln | Glu | Val | Glu | Val | Arg | Gln |
| | | | 100 | | | | | 105 | | | | | | 110 | |
| Ala | Arg | Asp | Ser | Lys | Leu | Ser | Asp | Ser | Lys | His | Val | Ala | Leu | His | Asn |
| | 115 | | | | | | 120 | | | | | 125 | | | |
| Leu | Ile | Leu | Ser | Tyr | Met | Glu | Met | Ser | Lys | Thr | Pro | Ala | Ser | Leu | Ile |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Asn | Asn | Leu | Lys | Arg | Leu | Pro | Arg | Glu | Lys | Leu | Lys | Lys | Leu | Ala | Lys |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Leu | Ile | Ile | Asp | Leu | Ser | Ala | Gly | Ala | Asp | Asn | Asp | Ser | Ser | Tyr | Ala |
| | | | 165 | | | | | | 170 | | | | | 175 | |
| Leu | Gln | Asp | Ser | Glu | Ser | Thr | Asn | Gln | Val | Gln | | | | | |
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<210> 340
 <211> 187
 <212> PRT
 <213> human metapneumo virus

<400> 340

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| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Arg | Gly | Ser | Asp | Cys | Lys | Phe | Asn | His | Asn | Tyr | Trp | Ser | Trp | Pro | Asp |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Arg | Tyr | Leu | Leu | Leu | Arg | Ser | Asn | Tyr | Leu | Leu | Asn | Gln | Leu | Leu | Arg |
| | | | 35 | | | | 40 | | | | | 45 | | | |
| Asn | Thr | Asp | Lys | Ala | Asp | Gly | Leu | Ser | Ile | Ile | Ser | Gly | Ala | Gly | Arg |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Glu | Asp | Arg | Thr | Gln | Asp | Phe | Val | Leu | Gly | Ser | Thr | Asn | Val | Val | Gln |
| 65 | | | | 70 | | | | | | 75 | | | | | 80 |
| Gly | Tyr | Ile | Asp | Asp | Asn | Gln | Gly | Ile | Thr | Lys | Ala | Ala | Ala | Cys | Tyr |
| | | | 85 | | | | | 90 | | | | | | 95 | |
| Ser | Leu | His | Asn | Ile | Ile | Lys | Gln | Leu | Gln | Glu | Thr | Glu | Val | Arg | Gln |
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| Ala | Arg | Asp | Asn | Lys | Leu | Ser | Asp | Ser | Lys | His | Val | Ala | Leu | His | Asn |
| | | | 115 | | | | 120 | | | | | | 125 | | |

Leu Ile Leu Ser Tyr Met Glu Met Ser Lys Thr Pro Ala Ser Leu Ile
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 Asn Asn Leu Lys Lys Leu Pro Arg Glu Lys Leu Lys Lys Leu Ala Arg
 145 150 155 160
 Leu Ile Ile Asp Leu Ser Ala Gly Thr Asp Asn Asp Ser Ser Tyr Ala
 165 170 175
 Leu Gln Asp Ser Glu Ser Thr Asn Gln Val Gln
 180 185

<210> 341
 <211> 187
 <212> PRT
 <213> human metapneumo virus

<400> 341
 Met Ser Arg Lys Ala Pro Cys Lys Tyr Glu Val Arg Gly Lys Cys Asn
 1 5 10 15
 Arg Gly Ser Glu Cys Lys Phe Asn His Asn Tyr Trp Ser Trp Pro Asp
 20 25 30
 Arg Tyr Leu Leu Arg Ser Asn Tyr Leu Leu Asn Gln Leu Leu Arg
 35 40 45
 Asn Thr Asp Lys Ala Asp Gly Leu Ser Ile Ile Ser Gly Ala Gly Arg
 50 55 60
 Glu Asp Arg Thr Gln Asp Phe Val Leu Gly Ser Thr Asn Val Val Gln
 65 70 75 80
 Gly Tyr Ile Asp Asn Asn Gln Gly Ile Thr Lys Ala Ala Ala Cys Tyr
 85 90 95
 Ser Leu His Asn Ile Ile Lys Gln Leu Gln Glu Ile Glu Val Arg Gln
 100 105 110
 Ala Arg Asp Asn Lys Leu Ser Asp Ser Lys His Val Ala Leu His Asn
 115 120 125
 Leu Ile Leu Ser Tyr Met Glu Met Ser Lys Thr Pro Ala Ser Leu Ile
 130 135 140
 Asn Asn Leu Lys Lys Leu Pro Arg Glu Lys Leu Lys Lys Leu Ala Lys
 145 150 155 160
 Leu Ile Ile Asp Leu Ser Ala Gly Thr Asp Asn Asp Ser Ser Tyr Ala
 165 170 175
 Leu Gln Asp Ser Glu Ser Thr Asn Gln Val Gln
 180 185

<210> 342
 <211> 564
 <212> DNA
 <213> human metapneumo virus

<400> 342
 atgtctcgca aggctccgtg caaatatgaa gtgcggggca aatgcaatag aggaagttag 60
 tgcaagttta accacaatta ctggagttgg ccagatagat acttattaat aagatcaaatt 120
 tattttattaa atcaactttt aaggaacact gatagagctg atggcttatc aataatatca 180
 ggagcaggca gagaagatag gacacaagat tttgtcctag gttccaccaa tgtggttcaa 240
 gggttatattg atgataacca aagcataaca aaagctgcag cctggttacag tctacataat 300
 ataatacaaac aactacaaga agttgaagtt aggcaggcta gagataacaa actatctgac 360
 agcaaacatg tagcacttca caacttagtc ctatcttata tggagatgag caaaactcct 420
 gcattctttaa tcaacaatct caagagactg ccgagagaga aactgaaaaa attagcaaag 480
 ctcataattg acttatcagc aggtgctgaa aatgactctt catatgcctt gcaagacagt 540
 gaaagcacta atcaagtgc gtga 564

<210> 343
 <211> 564

<212> DNA
 <213> human metapneumo virus

<400> 343
 atgtctcgca aggctccatg caaatatgaa gtgcgggggca aatgcaacag aggaagtgtg 60
 tgtaagttta accacaatta ctggagttgg ccagatagat acttattaat aagatcaaac 120
 tatctattaa atcagctttt aaggaacact gatagagctg atggcctatc aataatatca 180
 ggcgaggca gagaagacag aacgcaagat tttgttctag gttccaccaa tgtggttcaa 240
 gggttatattg atgataacca aagcataaca aaagctgcag cctgctacag tctacacaac 300
 ataataaagc aactacaaga agttgaagtt aggcaggcta gagatagcaa actatctgac 360
 agcaagcatg tggcactcca taacttaatc ttatcttaca tggagatgag caaaactccc 420
 gcatctttaa tcaacaatct taaaagactg ccgagagaaa aactgaaaaa attagcaaag 480
 ctgataattg acttatcagc aggcgctgac aatgactcct catatgccct gcaagacagt 540
 gaaagcacta atcaagtgtga gtga 564

<210> 344
 <211> 564
 <212> DNA
 <213> human metapneumo virus

<400> 344
 atgtctcgta aggctccatg caaatatgaa gtgcgggggca aatgcaacag agggagtgtg 60
 tgcaaatcca atcacaatta ctggagttgg cctgatagat atttattgtt aagatcaaac 120
 tatctcttaa atcagctttt aagaaacaca gataaggctg atgggtttgtc aataatatca 180
 ggagcaggta gagaagatag aactcaagac tttgttcttg gttctactaa tgtggttcaa 240
 ggggtacattg atgacaacca aggaataacc aaggctgcag cttgctatag tctacacaac 300
 ataataaagc aactacaaga aacagaagta agacaggcta gagacaacaa gctttctgat 360
 agcaaacatg tggcgctcca caacttgata ttatcctata tggagatgag caaaactcct 420
 gcatctctaa tcaacaacct aaagaaacta ccaagggaaa aactgaagaa attagcaaga 480
 ttaataattg atttatcagc aggaactgac aatgactcct catatgccct gcaagacagt 540
 gaaagcacta atcaagtgtga gtaa 564

<210> 345
 <211> 564
 <212> DNA
 <213> human metapneumo virus

<400> 345
 atgtctcgca aagctccatg caaatatgaa gtacgggggca agtgcaacag ggggaagtgtg 60
 tgcaaatcca accacaatta ctggagctgg cctgataggt atttattgtt aagatcaaac 120
 tatctcttga atcagctttt aagaaacact gataaggctg atgggtttgtc aataatatca 180
 ggagcaggta gagaagatag gactcaagac tttgttcttg gttctactaa tgtggttcaa 240
 ggggtacattg ataacaatca aggaataaca aaggctgcag cttgctatag tctacataac 300
 ataataaaaac agctacaaga aatagaagta agacaggcta gagataataa gctttctgac 360
 agcaaacatg tggcacttca caacttgata ttatcctata tggagatgag caaaactcct 420
 gcatccctga ttaataacct aaagaaacta ccaagagaaa aactgaagaa attagcgaaa 480
 ttaataattg atttatcagc aggaactgat aatgactcct catatgccct gcaagacagt 540
 gaaagcacta atcaagtgtga gtaa 564

<210> 346
 <211> 71
 <212> PRT
 <213> human metapneumo virus

<400> 346
 Met Thr Leu His Met Pro Cys Lys Thr Val Lys Ala Leu Ile Lys Cys
 1 5 10 15
 Ser Glu His Gly Pro Val Phe Ile Thr Ile Glu Val Asp Asp Met Ile
 20 25 30
 Trp Thr His Lys Asp Leu Lys Glu Ala Leu Ser Asp Gly Ile Val Lys
 35 40 45

Ser His Thr Asn Ile Tyr Asn Cys Tyr Leu Glu Asn Ile Glu Ile Ile
 50 55 60
 Tyr Val Lys Ala Tyr Leu Ser
 65 70

<210> 347
 <211> 71
 <212> PRT
 <213> human metapneumo virus

<400> 347
 Met Thr Leu His Met Pro Cys Lys Thr Val Lys Ala Leu Ile Lys Cys
 1 5 10 15
 Ser Glu His Gly Pro Val Phe Ile Thr Ile Glu Val Asp Glu Met Ile
 20 25 30
 Trp Thr Gln Lys Glu Leu Lys Glu Ala Leu Ser Asp Gly Ile Val Lys
 35 40 45
 Ser His Thr Asn Ile Tyr Asn Cys Tyr Leu Glu Asn Ile Glu Ile Ile
 50 55 60
 Tyr Val Lys Ala Tyr Leu Ser
 65 70

<210> 348
 <211> 71
 <212> PRT
 <213> human metapneumo virus

<400> 348
 Met Thr Leu His Met Pro Cys Lys Thr Val Lys Ala Leu Ile Lys Cys
 1 5 10 15
 Ser Lys His Gly Pro Lys Phe Ile Thr Ile Glu Ala Asp Asp Met Ile
 20 25 30
 Trp Thr His Lys Glu Leu Lys Glu Thr Leu Ser Asp Gly Ile Val Lys
 35 40 45
 Ser His Thr Asn Ile Tyr Ser Cys Tyr Leu Glu Asn Ile Glu Ile Ile
 50 55 60
 Tyr Val Lys Thr Tyr Leu Ser
 65 70

<210> 349
 <211> 71
 <212> PRT
 <213> human metapneumo virus

<400> 349
 Met Thr Leu His Met Pro Cys Lys Thr Val Lys Ala Leu Ile Lys Cys
 1 5 10 15
 Ser Lys His Gly Pro Lys Phe Ile Thr Ile Glu Ala Asp Asp Met Ile
 20 25 30
 Trp Thr His Lys Glu Leu Lys Glu Thr Leu Ser Asp Gly Ile Val Lys
 35 40 45
 Ser His Thr Asn Ile Tyr Ser Cys Tyr Leu Glu Asn Ile Glu Ile Ile
 50 55 60
 Tyr Val Lys Ala Tyr Leu Ser
 65 70

<210> 350

<211> 216
 <212> DNA
 <213> human metapneumo virus

<400> 350
 atgactcttc atatgccttg caagacagtg aaagcactaa tcaagtgcag tgagcatggg 60
 ccagttttca ttactataga ggttgatgac atgatatgga ctcacaagga cttaaaagaa 120
 gctttatctg atgggatagt gaagtctcat actaacattt acaattgtta tttagaaaac 180
 atagaaatta tatatgtcaa ggcttactta agtttag 216

<210> 351
 <211> 216
 <212> DNA
 <213> human metapneumo virus

<400> 351
 atgactcttc atatgccttg caagacagtg aaagcactaa tcaagtgcag tgagcatggg 60
 cctgttttca ttactataga ggttgatgaa atgatatgga ctcacaaaaga attaaaagaa 120
 gctttgtccg atgggatagt gaagtctcac accaacattt acaattgtta tttagaaaac 180
 atagaaatta tatatgtcaa ggcttactta agtttag 216

<210> 352
 <211> 216
 <212> DNA
 <213> human metapneumo virus

<400> 352
 atgactcttc atatgccttg caagacagtg aaagcactaa tcaagtgcag taaacatggg 60
 cccaaattca ttaccataga ggcagatgat atgatatgga ctcacaaaaga attaaaagaa 120
 acactgtctg atgggatagt aaaatcacac accaatattt atagttgtta cttagaaaat 180
 atagaaataa tatatgttaa aacttactta agtttag 216

<210> 353
 <211> 216
 <212> DNA
 <213> human metapneumo virus

<400> 353
 atgactcttc atatgccttg caagacagtg aaagcactaa tcaagtgcag taagcatggg 60
 cccaaattca ttaccataga ggcagatgat atgatatgga cacacaaaaga attaaaggag 120
 acactgtctg atgggatagt aaaatcacac accaatattt acagttgtta tttagaaaat 180
 atagaaataa tatatgttaa agcttactta agtttag 216

<210> 354
 <211> 727
 <212> DNA
 <213> human metapneumo virus

<400> 354
 atgtctcgca aggctccgtg caaatatgaa gtgcggggca aatgcaatag aggaagtggg 60
 tgcaagttta accacaatta ctggagttgg ccagatagat acttattaat aagatcaaat 120
 tatttattaa atcaactttt aaggaacact gatagagctg atggcttatc aataatatca 180
 ggagcaggca gagaagatag gacacaagat ttgtcctag gttccaccaa tgtggttcaa 240
 gggttatattg atgataacca aagcataaca aaagctgcag cctgttacag tctacataat 300
 ataatacaaac aactacaaga agttgaagtt aggcaggcta gagataacaa actatctgac 360
 agcaaactg tagcacttca caacttagtc ctatcttata tggagatgag caaaactcct 420
 gcatctttta tcaacaatct caagagactg ccgagagaga aactgaaaaa attagcaaag 480
 ctcataattg acttatcagc aggtgctgaa aatgactctt catatgcctt gcaagacagt 540
 gaaagcacta atcaagtgcg gtgagcatgg tccagttttc attactatag aggttgatga 600
 catgatatgg actcacaagg acttaaaaga agctttatct gatgggatag tgaagtctca 660
 tactaacatt tacaattggt atttagaaaa catagaaatt atatatgtca aggcttactt 720

aagttag

727

<210> 355

<211> 727

<212> DNA

<213> human metapneumo virus

<400> 355

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atgtctcgca aggctccatg caaatatgaa gtgcggggca aatgcaacag aggaagtgag 60
tgtaagttta accacaatta ctggagttgg ccagatagat acttattaat aagatcaaac 120
tatctattaa atcagctttt aaggaacact gatagagctg atggcctatc aataatatca 180
ggcgaggca gagaagacag aacgcaagat tttgttctag gttccaccaa tgtggttcaa 240
ggttatattg atgataacca aagcataaca aaagctgcag cctgctacag tctacacaac 300
ataatcaagc aactacaaga agttgaagtt aggcaggcta gagatagcaa actatctgac 360
agcaagcatg tggcactcca taacttaatc ttatcttaca tggagatgag caaaactccc 420
gcatctttta tcaacaatct taaaagactg ccgagagaaa aactgaaaaa attagcaaaag 480
ctgataattg acttatcagc aggcgctgac aatgactctt catatgccct gcaagacagt 540
gaaagcacta atcaagtgcg gtgagcatgg tcctgttttc attactatag aggttgatga 600
aatgatattg actcaaaaag aattaaaaga agctttgtcc gatgggatag tgaagtctca 660
caccaacatt tacaattggt atttagaaaa catagaaatt atatatgtca aggcttactt 720
aagttag 727
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<210> 356

<211> 727

<212> DNA

<213> human metapneumo virus

<400> 356

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atgtctcgta aggctccatg caaatatgaa gtgcggggca aatgcaacag agggagtgat 60
tgcaaattca atcacaatta ctggagttgg cctgatagat atttattggt aagatcaaatt 120
tatctcttaa atcagctttt aagaaacaca gataaggctg atggtttgtc aataatatca 180
ggagcaggta gagaagatag aactcaagac tttgttcttg gttctactaa tgtggttcaa 240
gggtacattg atgacaacca aggaataacc aaggctgcag cttgctatag tctacacaac 300
ataatcaagc aactacaaga aacagaagta agacaggcta gagacaacaa gctttctgat 360
agcaaacatg tggcgctcca caacttgata ttatcctata tggagatgag caaaactcct 420
gcatctctaa tcaacaacct aaagaaacta ccaagggaaa aactgaagaa attagcaaga 480
ttaataattg atttatcagc aggaactgac aatgactctt catatgcctt gcaagacagt 540
gaaagcacta atcaagtgcg gtaaacatgg tcccaaattc attaccatag aggcagatga 600
tatgatattg actcacaag aattaaaaga aacactgtct gatgggatag taaaatcaca 660
caccaatatt tatagttggt acttagaaaa tatagaaata atatatgtta aaacttactt 720
aagttag 727
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<210> 357

<211> 727

<212> DNA

<213> human metapneumo virus

<400> 357

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atgtctcgca aagctccatg caaatatgaa gtacggggca agtgcaacag gggaagtgag 60
tgcaaattca accacaatta ctggagctgg cctgataggt atttattggt aagatcaaatt 120
tatctcttga atcagctttt aagaaacact gataaggctg atggtttgtc aataatatca 180
ggagcaggta gagaagatag gactcaagac tttgttcttg gttctactaa tgtggttcaa 240
gggtacattg ataacaatca aggaataaca aaggctgcag cttgctatag tctacataac 300
ataataaaaac agctacaaga aatagaagta agacaggcta gagataataa gctttctgac 360
agcaaacatg tggcacttca caacttgata ttatcctata tggagatgag caaaactcct 420
gcatccctga ttaataacct aaagaaacta ccaagagaaa aactgaagaa attagcgaag 480
ttaataattg atttatcagc aggaactgat aatgactctt catatgcctt gcaagacagt 540
gaaagcacta atcaagtgcg gtaagcatgg tcccaaattc attaccatag aggcagatga 600
tatgatattg acacacaaag aattaaagga gacactgtct gatgggatag taaaatcaca 660
caccaatatt tacagttggt atttagaaaa tatagaaata atatatgtta aagcttactt 720
aagttag 727
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<210> 358
 <211> 254
 <212> PRT
 <213> human metapneumo virus

<400> 358
 Met Glu Ser Tyr Leu Val Asp Thr Tyr Gln Gly Ile Pro Tyr Thr Ala
 1 5 10 15
 Ala Val Gln Val Asp Leu Ile Glu Lys Asp Leu Leu Pro Ala Ser Leu
 20 25 30
 Thr Ile Trp Phe Pro Leu Phe Gln Ala Asn Thr Pro Pro Ala Val Leu
 35 40 45
 Leu Asp Gln Leu Lys Thr Leu Thr Ile Thr Thr Leu Tyr Ala Ala Ser
 50 55 60
 Gln Asn Gly Pro Ile Leu Lys Val Asn Ala Ser Ala Gln Gly Ala Ala
 65 70 75 80
 Met Ser Val Leu Pro Lys Lys Phe Glu Val Asn Ala Thr Val Ala Leu
 85 90 95
 Asp Glu Tyr Ser Lys Leu Glu Phe Asp Lys Leu Thr Val Cys Glu Val
 100 105 110
 Lys Thr Val Tyr Leu Thr Thr Met Lys Pro Tyr Gly Met Val Ser Lys
 115 120 125
 Phe Val Ser Ser Ala Lys Ser Val Gly Lys Lys Thr His Asp Leu Ile
 130 135 140
 Ala Leu Cys Asp Phe Met Asp Leu Glu Lys Asn Thr Pro Val Thr Ile
 145 150 155 160
 Pro Ala Phe Ile Lys Ser Val Ser Ile Lys Glu Ser Glu Ser Ala Thr
 165 170 175
 Val Glu Ala Ala Ile Ser Ser Glu Ala Asp Gln Ala Leu Thr Gln Ala
 180 185 190
 Lys Ile Ala Pro Tyr Ala Gly Leu Ile Met Ile Met Thr Met Asn Asn
 195 200 205
 Pro Lys Gly Ile Phe Lys Lys Leu Gly Ala Gly Thr Gln Val Ile Val
 210 215 220
 Glu Leu Gly Ala Tyr Val Gln Ala Glu Ser Ile Ser Lys Ile Cys Lys
 225 230 235 240
 Thr Trp Ser His Gln Gly Thr Arg Tyr Val Leu Lys Ser Arg
 245 250

<210> 359
 <211> 254
 <212> PRT
 <213> human metapneumo virus

<400> 359
 Met Glu Ser Tyr Leu Val Asp Thr Tyr Gln Gly Ile Pro Tyr Thr Ala
 1 5 10 15
 Ala Val Gln Val Asp Leu Val Glu Lys Asp Leu Leu Pro Ala Ser Leu
 20 25 30
 Thr Ile Trp Phe Pro Leu Phe Gln Ala Asn Thr Pro Pro Ala Val Leu
 35 40 45
 Leu Asp Gln Leu Lys Thr Leu Thr Ile Thr Thr Leu Tyr Ala Ala Ser
 50 55 60
 Gln Ser Gly Pro Ile Leu Lys Val Asn Ala Ser Ala Gln Gly Ala Ala
 65 70 75 80
 Met Ser Val Leu Pro Lys Lys Phe Glu Val Asn Ala Thr Val Ala Leu
 85 90 95
 Asp Glu Tyr Ser Lys Leu Glu Phe Asp Lys Leu Thr Val Cys Glu Val
 100 105 110

Lys Thr Val Tyr Leu Thr Thr Met Lys Pro Tyr Gly Met Val Ser Lys
 115 120 125
 Phe Val Ser Ser Ala Lys Ser Val Gly Lys Lys Thr His Asp Leu Ile
 130 135 140
 Ala Leu Cys Asp Phe Met Asp Leu Glu Lys Asn Thr Pro Val Thr Ile
 145 150 155 160
 Pro Ala Phe Ile Lys Ser Val Ser Ile Lys Glu Ser Glu Ser Ala Thr
 165 170 175
 Val Glu Ala Ala Ile Ser Ser Glu Ala Asp Gln Ala Leu Thr Gln Ala
 180 185 190
 Lys Ile Ala Pro Tyr Ala Gly Leu Ile Met Ile Met Thr Met Asn Asn
 195 200 205
 Pro Lys Gly Ile Phe Lys Lys Leu Gly Ala Gly Thr Gln Val Ile Val
 210 215 220
 Glu Leu Gly Ala Tyr Val Gln Ala Glu Ser Ile Ser Lys Ile Cys Lys
 225 230 235 240
 Thr Trp Ser His Gln Gly Thr Arg Tyr Val Leu Lys Ser Ser
 245 250

<210> 360

<211> 254

<212> PRT

<213> human metapneumo virus

<400> 360

Met Glu Ser Tyr Leu Val Asp Thr Tyr Gln Gly Ile Pro Tyr Thr Ala
 1 5 10 15
 Ala Val Gln Val Asp Leu Val Glu Lys Asp Leu Leu Pro Ala Ser Leu
 20 25 30
 Thr Ile Trp Phe Pro Leu Phe Gln Ala Asn Thr Pro Pro Ala Val Leu
 35 40 45
 Leu Asp Gln Leu Lys Thr Leu Thr Ile Thr Thr Leu Tyr Ala Ala Ser
 50 55 60
 Gln Asn Gly Pro Ile Leu Lys Val Asn Ala Ser Ala Gln Gly Ala Ala
 65 70 75 80
 Met Ser Val Leu Pro Lys Lys Phe Glu Val Asn Ala Thr Val Ala Leu
 85 90 95
 Asp Glu Tyr Ser Lys Leu Asp Phe Asp Lys Leu Thr Val Cys Asp Val
 100 105 110
 Lys Thr Val Tyr Leu Thr Thr Met Lys Pro Tyr Gly Met Val Ser Lys
 115 120 125
 Phe Val Ser Ser Ala Lys Ser Val Gly Lys Lys Thr His Asp Leu Ile
 130 135 140
 Ala Leu Cys Asp Phe Met Asp Leu Glu Lys Asn Ile Pro Val Thr Ile
 145 150 155 160
 Pro Ala Phe Ile Lys Ser Val Ser Ile Lys Glu Ser Glu Ser Ala Thr
 165 170 175
 Val Glu Ala Ala Ile Ser Ser Glu Ala Asp Gln Ala Leu Thr Gln Ala
 180 185 190
 Lys Ile Ala Pro Tyr Ala Gly Leu Ile Met Ile Met Thr Met Asn Asn
 195 200 205
 Pro Lys Gly Ile Phe Lys Lys Leu Gly Ala Gly Thr Gln Val Ile Val
 210 215 220
 Glu Leu Gly Ala Tyr Val Gln Ala Glu Ser Ile Ser Arg Ile Cys Lys
 225 230 235 240
 Ser Trp Ser His Gln Gly Thr Arg Tyr Val Leu Lys Ser Arg
 245 250

<210> 361

<211> 254
 <212> PRT
 <213> human metapneumo virus

<400> 361
 Met Glu Ser Tyr Leu Val Asp Thr Tyr Gln Gly Ile Pro Tyr Thr Ala
 1 5 10 15
 Ala Val Gln Val Asp Leu Val Glu Lys Asp Leu Leu Pro Ala Ser Leu
 20 25 30
 Thr Ile Trp Phe Pro Leu Phe Gln Ala Asn Thr Pro Pro Ala Val Leu
 35 40 45
 Leu Asp Gln Leu Lys Thr Leu Thr Ile Thr Thr Leu Tyr Ala Ala Ser
 50 55 60
 Gln Asn Gly Pro Ile Leu Lys Val Asn Ala Ser Ala Gln Gly Ala Ala
 65 70 75 80
 Met Ser Val Leu Pro Lys Lys Phe Glu Val Asn Ala Thr Val Ala Leu
 85 90 95
 Asp Glu Tyr Ser Lys Leu Asp Phe Asp Lys Leu Thr Val Cys Asp Val
 100 105 110
 Lys Thr Val Tyr Leu Thr Thr Met Lys Pro Tyr Gly Met Val Ser Lys
 115 120 125
 Phe Val Ser Ser Ala Lys Ser Val Gly Lys Lys Thr His Asp Leu Ile
 130 135 140
 Ala Leu Cys Asp Phe Met Asp Leu Glu Lys Asn Ile Pro Val Thr Ile
 145 150 155 160
 Pro Ala Phe Ile Lys Ser Val Ser Ile Lys Glu Ser Glu Ser Ala Thr
 165 170 175
 Val Glu Ala Ala Ile Ser Ser Glu Ala Asp Gln Ala Leu Thr Gln Ala
 180 185 190
 Lys Ile Ala Pro Tyr Ala Gly Leu Ile Met Ile Met Thr Met Asn Asn
 195 200 205
 Pro Lys Gly Ile Phe Lys Lys Leu Gly Ala Gly Thr Gln Val Ile Val
 210 215 220
 Glu Leu Gly Ala Tyr Val Gln Ala Glu Ser Ile Ser Arg Ile Cys Lys
 225 230 235 240
 Ser Trp Ser His Gln Gly Thr Arg Tyr Val Leu Lys Ser Arg
 245 250

<210> 362
 <211> 765
 <212> DNA
 <213> human metapneumo virus

<400> 362
 atggagtcct acctagtaga cacctatcaa ggcattcctt acacagcagc tgttcaagtt 60
 gatctaataag aaaaggacct gttacctgca agcctaacaa tatgggttccc tttgtttcag 120
 gccaacacac caccagcagt gctgctcgat cagctaaaaa ccctgacaat aaccactctg 180
 tatgctgcat cacaaaatgg tccaatactc aaagtgaatg catcagccca aggtgcagca 240
 atgtctgtac ttcccaaaaa atttgaagtc aatgcgactg tagcactcga tgaatatagc 300
 aaactggaat ttgacaaaact cacagtctgt gaagtaaaaa cagtttactt aacaaccatg 360
 aaaccatacg ggatggtatc aaaattttgtg agctcagcca aatcagttgg caaaaaaaca 420
 catgatctaa tcgcactatg tgattttatg gatctagaaa agaacacacc tgttacaata 480
 ccagatttca tcaaatcagt ttcaatcaaa gagagtgagt cagctactgt tgaagctgct 540
 ataagcagtg aagcagacca agctctaaca caggccaaaa ttgcacctta tgcgggatta 600
 attatgatca tgactatgaa caatcccaaa ggcataattca aaaagcttgg agctgggact 660
 caagtcatag tagaactagg agcatatgtc caggctgaaa gcataagcaa aatatgcaag 720
 acttgagacc atcaagggac aagatatgtc ttgaagtcca gataa 765

<210> 363
 <211> 765

<212> DNA
 <213> human metapneumo virus

<400> 363
 atggagtcct atctggtaga cacttatcaa ggcattccctt acacagcagc tgttcaagtt 60
 gatctagtag aaaaggacct gttacctgca agcctaacaa tatggttccc cttgtttcag 120
 gccaatacac caccagcagt tctgcttgat cagctaaaga ctctgactat aactactctg 180
 tatgctgcat cacaaagtgg tccaatacta aaagtgaatg catcagccca ggggtgcagca 240
 atgtctgtac ttcccaaaaa gtttgaagtc aatgcgactg tagcacttga cgaatatagc 300
 aaattagaat ttgacaaact tacagtctgt gaagtaaaaa cagtttactt aacaaccatg 360
 aaaccatatg ggatgggtatc aaagtttgtg agctcggcca aatcagttgg caaaaaaaca 420
 catgatctaa tcgcattatg tgattttatg gatctagaaa agaacacacc agttacaata 480
 ccagcattta tcaaatcagt ttctatcaag gagagtgaat cagccactgt tgaagctgca 540
 ataagcagtg aagcagacca agctctaaca caagccaaaa ttgcacctta tgcgggactg 600
 atcatgatta tgaccatgaa caatcccaaa ggcataattca agaagcttgg agctgggacc 660
 caagttatag tagaactagg agcatatgtc caggctgaaa gcataagtaa aatatgcaag 720
 acttggagcc atcaaggaac aagatatgtg ctgaagtcca gttaa 765

<210> 364
 <211> 765
 <212> DNA
 <213> human metapneumo virus

<400> 364
 atggagtcct atctagtaga cacttatcaa ggcattccat atacagctgc tgttcaagtt 60
 gacctggtag aaaaagattt actgccagca agtttgacaa tatggtttcc tttatttcag 120
 gccaacacac caccagcagt tctgcttgat cagctaaaaa ccttgacaat aacaactctg 180
 tatgctgcat cacagaatgg tccaatactc aaggtaaatg catctgcca aggtgctgcc 240
 atgtctgtac ttcccaaaaa attcgaggta aatgcaactg tagcacttga tgaatacagt 300
 aaacttgatt ttgacaagct gacggtctgc gatgttaaaa cagtttattt gacaactatg 360
 aaaccgtacg ggatgggtgtc aaaatttgtg agttcagcca aatcagttgg caaaaagaca 420
 catgatctaa ttgcaactat tgacttcatg gacctagaga aaaatatacc tgtgacaata 480
 ccagcattca taaagtcagt ttcaatcaaa gagagtgaat cagccactgt tgaagctgca 540
 ataagcagcg aagccgacca agccttgaca caagccaaga ttgcgcctta tgcaggacta 600
 attatgatca tgaccatgaa caatcccaaa ggtatattca agaaactagg ggctggaaca 660
 caagtgatag tagagctggg ggcataatgtt caggctgaga gcatcagtag gatctgcaag 720
 agctggagtc accaaggaac aagatacgtg ctaaaatcca gataa 765

<210> 365
 <211> 765
 <212> DNA
 <213> human metapneumo virus

<400> 365
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 gatctggtag aaaaagactt actaccagca agtttgacaa tatggtttcc tctattccaa 120
 gccaacacac caccagcggg tttgctcgat cagctaaaaa ccttgactat aacaactctg 180
 tatgctgcat cacagaatgg tccaatactc aaagtaaatg catcagctca ggggtgctgct 240
 atgtctgtac ttcccaaaaa attcgaagta aatgcaactg tggcacttga tgaatacagc 300
 aaacttgact ttgacaagtt aacggtttgc gatgttaaaa cagtttattt gacaaccatg 360
 aagccatatg ggatgggtgtc aaaatttgtg agttcagcca aatcagttgg caaaaagaca 420
 catgatctaa ttgcaactgt tgacttcatg gacctagaga aaaatatacc tgtgacaata 480
 ccagcattca taaagtcagt ttcaatcaaa gagagtgaat cagccactgt tgaagctgca 540
 ataagcagtg aggcgacca agcatcaaca caagccaaaa ttgcacccta tgcaggacta 600
 atcatgatca tgaccatgaa caatcccaaa ggtatattca agaaactagg agctggaaca 660
 caagtgatag tagagctagg ggcataatgtt caagccgaga gcatcagcag gatctgcaag 720
 agctggagtc accaaggaac aagatatgta ctaaaatcca gataa 765

<210> 366
 <211> 394
 <212> PRT

<213> human metapneumo virus

<400> 366

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Ile Leu Lys Glu Ser Gln Tyr Thr Ile Lys Arg Asp Val Gly Thr Thr
20      25      30
Thr Ala Val Thr Pro Ser Ser Leu Gln Gln Glu Ile Thr Leu Leu Cys
35      40      45
Gly Glu Ile Leu Tyr Ala Lys His Ala Asp Tyr Lys Tyr Ala Ala Glu
50      55      60
Ile Gly Ile Gln Tyr Ile Ser Thr Ala Leu Gly Ser Glu Arg Val Gln
65      70      75      80
Gln Ile Leu Arg Asn Ser Gly Ser Glu Val Gln Val Val Leu Thr Arg
85      90      95
Thr Tyr Ser Leu Gly Lys Ile Lys Asn Asn Lys Gly Glu Asp Leu Gln
100     105     110
Met Leu Asp Ile His Gly Val Glu Lys Ser Trp Val Glu Glu Ile Asp
115     120     125
Lys Glu Ala Arg Lys Thr Met Ala Thr Leu Leu Lys Glu Ser Ser Gly
130     135     140
Asn Ile Pro Gln Asn Gln Arg Pro Ser Ala Pro Asp Thr Pro Ile Ile
145     150     155     160
Leu Leu Cys Val Gly Ala Leu Ile Phe Thr Lys Leu Ala Ser Thr Ile
165     170     175
Glu Val Gly Leu Glu Thr Thr Val Arg Arg Ala Asn Arg Val Leu Ser
180     185     190
Asp Ala Leu Lys Arg Tyr Pro Arg Met Asp Ile Pro Lys Ile Ala Arg
195     200     205
Ser Phe Tyr Asp Leu Phe Glu Gln Lys Val Tyr His Arg Ser Leu Phe
210     215     220
Ile Glu Tyr Gly Lys Ala Leu Gly Ser Ser Ser Thr Gly Ser Lys Ala
225     230     235     240
Glu Ser Leu Phe Val Asn Ile Phe Met Gln Ala Tyr Gly Ala Gly Gln
245     250     255
Thr Met Leu Arg Trp Gly Val Ile Ala Arg Ser Ser Asn Asn Ile Met
260     265     270
Leu Gly His Val Ser Val Gln Ala Glu Leu Lys Gln Val Thr Glu Val
275     280     285
Tyr Asp Leu Val Arg Glu Met Gly Pro Glu Ser Gly Leu Leu His Leu
290     295     300
Arg Gln Ser Pro Lys Ala Gly Leu Leu Ser Leu Ala Asn Cys Pro Asn
305     310     315     320
Phe Ala Ser Val Val Leu Gly Asn Ala Ser Gly Leu Gly Ile Ile Gly
325     330     335
Met Tyr Arg Gly Arg Val Pro Asn Thr Glu Leu Phe Ser Ala Ala Glu
340     345     350
Ser Tyr Ala Lys Ser Leu Lys Glu Ser Asn Lys Ile Asn Phe Ser Ser
355     360     365
Leu Gly Leu Thr Asp Glu Glu Lys Glu Ala Ala Glu His Phe Leu Asn
370     375     380
Val Ser Asp Asp Ser Gln Asn Asp Tyr Glu
385     390
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<210> 367

<211> 394

<212> PRT

<213> human metapneumo virus

<400> 367

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ser | Leu | Gln | Gly | Ile | His | Leu | Ser | Asp | Leu | Ser | Tyr | Lys | His | Ala |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Ile | Leu | Lys | Glu | Ser | Gln | Tyr | Thr | Ile | Lys | Arg | Asp | Val | Gly | Thr | Thr |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Thr | Ala | Val | Thr | Pro | Ser | Ser | Leu | Gln | Gln | Glu | Ile | Thr | Leu | Leu | Cys |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Gly | Glu | Ile | Leu | Tyr | Ala | Lys | His | Ala | Asp | Tyr | Lys | Tyr | Ala | Ala | Glu |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Ile | Gly | Ile | Gln | Tyr | Ile | Ser | Thr | Ala | Leu | Gly | Ser | Glu | Arg | Val | Gln |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Gln | Ile | Leu | Arg | Asn | Ser | Gly | Ser | Glu | Val | Gln | Val | Val | Leu | Thr | Arg |
| | | | 85 | | | | | | 90 | | | | | 95 | |
| Thr | Tyr | Ser | Leu | Gly | Lys | Val | Lys | Asn | Asn | Lys | Gly | Glu | Asp | Leu | Gln |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Met | Leu | Asp | Ile | His | Gly | Val | Glu | Lys | Ser | Trp | Val | Glu | Glu | Ile | Asp |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Lys | Glu | Ala | Arg | Lys | Thr | Met | Ala | Thr | Leu | Leu | Lys | Glu | Ser | Ser | Gly |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Asn | Ile | Pro | Gln | Asn | Gln | Arg | Pro | Ser | Ala | Pro | Asp | Thr | Pro | Ile | Ile |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Leu | Leu | Cys | Val | Gly | Ala | Leu | Ile | Phe | Thr | Lys | Leu | Ala | Ser | Thr | Ile |
| | | | 165 | | | | | 170 | | | | | | 175 | |
| Glu | Val | Gly | Leu | Glu | Thr | Thr | Val | Arg | Arg | Ala | Asn | Arg | Val | Leu | Ser |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Asp | Ala | Leu | Lys | Arg | Tyr | Pro | Arg | Met | Asp | Ile | Pro | Lys | Ile | Ala | Arg |
| | | 195 | | | | | 200 | | | | | 205 | | | |
| Ser | Phe | Tyr | Asp | Leu | Phe | Glu | Gln | Lys | Val | Tyr | Tyr | Arg | Ser | Leu | Phe |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Ile | Glu | Tyr | Gly | Lys | Ala | Leu | Gly | Ser | Ser | Ser | Thr | Gly | Ser | Lys | Ala |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 |
| Glu | Ser | Leu | Phe | Val | Asn | Ile | Phe | Met | Gln | Ala | Tyr | Gly | Ala | Gly | Gln |
| | | | 245 | | | | | 250 | | | | | | 255 | |
| Thr | Met | Leu | Arg | Trp | Gly | Val | Ile | Ala | Arg | Ser | Ser | Asn | Asn | Ile | Met |
| | | 260 | | | | | | 265 | | | | | 270 | | |
| Leu | Gly | His | Val | Ser | Val | Gln | Ala | Glu | Leu | Lys | Gln | Val | Thr | Glu | Val |
| | | 275 | | | | 280 | | | | | | 285 | | | |
| Tyr | Asp | Leu | Val | Arg | Glu | Met | Gly | Pro | Glu | Ser | Gly | Leu | Leu | His | Leu |
| | 290 | | | | | 295 | | | | | 300 | | | | |
| Arg | Gln | Ser | Pro | Lys | Ala | Gly | Leu | Leu | Ser | Leu | Ala | Asn | Cys | Pro | Asn |
| 305 | | | | | 310 | | | | | 315 | | | | | 320 |
| Phe | Ala | Ser | Val | Val | Leu | Gly | Asn | Ala | Ser | Gly | Leu | Gly | Ile | Ile | Gly |
| | | | 325 | | | | | 330 | | | | | | 335 | |
| Met | Tyr | Arg | Gly | Arg | Val | Pro | Asn | Thr | Glu | Leu | Phe | Ser | Ala | Ala | Glu |
| | | 340 | | | | | | 345 | | | | | 350 | | |
| Ser | Tyr | Ala | Lys | Ser | Leu | Lys | Glu | Ser | Asn | Lys | Ile | Asn | Phe | Ser | Ser |
| | | 355 | | | | 360 | | | | | 365 | | | | |
| Leu | Gly | Leu | Thr | Asp | Glu | Glu | Lys | Glu | Ala | Ala | Glu | His | Phe | Leu | Asn |
| | 370 | | | | | 375 | | | | | 380 | | | | |
| Val | Ser | Asp | Asp | Ser | Gln | Asn | Asp | Tyr | Glu | | | | | | |
| 385 | | | | | 390 | | | | | | | | | | |

<210> 368

<211> 394

<212> PRT

<213> human metapneumo virus

<400> 368

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ser | Leu | Gln | Gly | Ile | His | Leu | Ser | Asp | Leu | Ser | Tyr | Lys | His | Ala |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Ile | Leu | Lys | Glu | Ser | Gln | Tyr | Thr | Ile | Lys | Arg | Asp | Val | Gly | Thr | Thr |

| | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| | | | 20 | | | | | 25 | | | | | 30 | | | | |
| Thr | Ala | Val | Thr | Pro | Ser | Ser | Leu | Gln | Gln | Glu | Ile | Thr | Leu | Leu | Cys | | |
| | | 35 | | | | | 40 | | | | | 45 | | | | | |
| Gly | Glu | Ile | Leu | Tyr | Thr | Lys | His | Thr | Asp | Tyr | Lys | Tyr | Ala | Ala | Glu | | |
| | | 50 | | | | 55 | | | | | 60 | | | | | | |
| Ile | Gly | Ile | Gln | Tyr | Ile | Cys | Thr | Ala | Leu | Gly | Ser | Glu | Arg | Val | Gln | | |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 | | |
| Gln | Ile | Leu | Arg | Asn | Ser | Gly | Ser | Glu | Val | Gln | Val | Val | Leu | Thr | Lys | | |
| | | | | 85 | | | | | 90 | | | | | 95 | | | |
| Thr | Tyr | Ser | Leu | Gly | Lys | Gly | Lys | Asn | Ser | Lys | Gly | Glu | Glu | Leu | Gln | | |
| | | | 100 | | | | | 105 | | | | | | 110 | | | |
| Met | Leu | Asp | Ile | His | Gly | Val | Glu | Lys | Ser | Trp | Ile | Glu | Glu | Ile | Asp | | |
| | | 115 | | | | | 120 | | | | | 125 | | | | | |
| Lys | Glu | Ala | Arg | Lys | Thr | Met | Val | Thr | Leu | Leu | Lys | Glu | Ser | Ser | Gly | | |
| | | 130 | | | | 135 | | | | | 140 | | | | | | |
| Asn | Ile | Pro | Gln | Asn | Gln | Arg | Pro | Ser | Ala | Pro | Asp | Thr | Pro | Ile | Ile | | |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 | | |
| Leu | Leu | Cys | Val | Gly | Ala | Leu | Ile | Phe | Thr | Lys | Leu | Ala | Ser | Thr | Ile | | |
| | | | 165 | | | | | 170 | | | | | | 175 | | | |
| Glu | Val | Gly | Leu | Glu | Thr | Thr | Val | Arg | Arg | Ala | Asn | Arg | Val | Leu | Ser | | |
| | | | 180 | | | | 185 | | | | | | 190 | | | | |
| Asp | Ala | Leu | Lys | Arg | Tyr | Pro | Arg | Ile | Asp | Ile | Pro | Lys | Ile | Ala | Arg | | |
| | | 195 | | | | 200 | | | | | 205 | | | | | | |
| Ser | Phe | Tyr | Glu | Leu | Phe | Glu | Gln | Lys | Val | Tyr | Tyr | Arg | Ser | Leu | Phe | | |
| | 210 | | | | 215 | | | | | | 220 | | | | | | |
| Ile | Glu | Tyr | Gly | Lys | Ala | Leu | Gly | Ser | Ser | Ser | Thr | Gly | Ser | Lys | Ala | | |
| 225 | | | | 230 | | | | | | 235 | | | | | 240 | | |
| Glu | Ser | Leu | Phe | Val | Asn | Ile | Phe | Met | Gln | Ala | Tyr | Gly | Ala | Gly | Gln | | |
| | | | 245 | | | | | 250 | | | | | | 255 | | | |
| Thr | Leu | Leu | Arg | Trp | Gly | Val | Ile | Ala | Arg | Ser | Ser | Asn | Asn | Ile | Met | | |
| | | 260 | | | | | 265 | | | | | | | 270 | | | |
| Leu | Gly | His | Val | Ser | Val | Gln | Ser | Glu | Leu | Lys | Gln | Val | Thr | Glu | Val | | |
| | | 275 | | | | 280 | | | | | | 285 | | | | | |
| Tyr | Asp | Leu | Val | Arg | Glu | Met | Gly | Pro | Glu | Ser | Gly | Leu | Leu | His | Leu | | |
| | 290 | | | | 295 | | | | | | 300 | | | | | | |
| Arg | Gln | Ser | Pro | Lys | Ala | Gly | Leu | Leu | Ser | Leu | Ala | Asn | Cys | Pro | Asn | | |
| | | | | 310 | | | | | | 315 | | | | | 320 | | |
| Phe | Ala | Ser | Val | Val | Leu | Gly | Asn | Ala | Ser | Gly | Leu | Gly | Ile | Ile | Gly | | |
| | | | 325 | | | | | 330 | | | | | | 335 | | | |
| Met | Tyr | Arg | Gly | Arg | Val | Pro | Asn | Thr | Glu | Leu | Phe | Ser | Ala | Ala | Glu | | |
| | | 340 | | | | 345 | | | | | | | 350 | | | | |
| Ser | Tyr | Ala | Arg | Ser | Leu | Lys | Glu | Ser | Asn | Lys | Ile | Asn | Phe | Ser | Ser | | |
| | | 355 | | | | 360 | | | | | | 365 | | | | | |
| Leu | Gly | Leu | Thr | Asp | Glu | Glu | Lys | Glu | Ala | Ala | Glu | His | Phe | Leu | Asn | | |
| | 370 | | | | 375 | | | | | | 380 | | | | | | |
| Met | Ser | Gly | Asp | Asn | Gln | Asn | Asp | Tyr | Glu | | | | | | | | |
| 385 | | | | | 390 | | | | | | | | | | | | |

<210> 369

<211> 394

<212> PRT

<213> human metapneumo virus

<400> 369

| | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| Met | Ser | Leu | Gln | Gly | Ile | His | Leu | Ser | Asp | Leu | Ser | Tyr | Lys | His | Ala | | |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | | | |
| Ile | Leu | Lys | Glu | Ser | Gln | Tyr | Thr | Ile | Lys | Arg | Asp | Val | Gly | Thr | Thr | | |
| | | | 20 | | | | | 25 | | | | | 30 | | | | |
| Thr | Ala | Val | Thr | Pro | Ser | Ser | Leu | Gln | Gln | Glu | Ile | Thr | Leu | Leu | Cys | | |
| | | 35 | | | | | 40 | | | | | 45 | | | | | |

Gly Glu Ile Leu Tyr Thr Lys His Thr Asp Tyr Lys Tyr Ala Ala Glu
 50 55 60
 Ile Gly Ile Gln Tyr Ile Cys Thr Ala Leu Gly Ser Glu Arg Val Gln
 65 70 75 80
 Gln Ile Leu Arg Asn Ser Gly Ser Glu Val Gln Val Val Leu Thr Lys
 85 90 95
 Thr Tyr Ser Leu Gly Lys Gly Lys Asn Ser Lys Gly Glu Glu Leu Gln
 100 105 110
 Met Leu Asp Ile His Gly Val Glu Lys Ser Trp Val Glu Glu Ile Asp
 115 120 125
 Lys Glu Ala Arg Lys Thr Met Val Thr Leu Leu Lys Glu Ser Ser Gly
 130 135 140
 Asn Ile Pro Gln Asn Gln Arg Pro Ser Ala Pro Asp Thr Pro Ile Ile
 145 150 155 160
 Leu Leu Cys Val Gly Ala Leu Ile Phe Thr Lys Leu Ala Ser Thr Ile
 165 170 175
 Glu Val Gly Leu Glu Thr Thr Val Arg Arg Ala Asn Arg Val Leu Ser
 180 185 190
 Asp Ala Leu Lys Arg Tyr Pro Arg Val Asp Ile Pro Lys Ile Ala Arg
 195 200 205
 Ser Phe Tyr Glu Leu Phe Glu Gln Lys Val Tyr Tyr Arg Ser Leu Phe
 210 215 220
 Ile Glu Tyr Gly Lys Ala Leu Gly Ser Ser Ser Thr Gly Ser Lys Ala
 225 230 235 240
 Glu Ser Leu Phe Val Asn Ile Phe Met Gln Ala Tyr Gly Ala Gly Gln
 245 250 255
 Thr Met Leu Arg Trp Gly Val Ile Ala Arg Ser Ser Asn Asn Ile Met
 260 265 270
 Leu Gly His Val Ser Val Gln Ala Glu Leu Lys Gln Val Thr Glu Val
 275 280 285
 Tyr Asp Leu Val Arg Glu Met Gly Pro Glu Ser Gly Leu Leu His Leu
 290 295 300
 Arg Gln Ser Pro Lys Ala Gly Leu Leu Ser Leu Ala Asn Cys Pro Asn
 305 310 315 320
 Phe Ala Ser Val Val Leu Gly Asn Ala Ser Gly Leu Gly Ile Ile Gly
 325 330 335
 Met Tyr Arg Gly Arg Val Pro Asn Thr Glu Leu Phe Ser Ala Ala Glu
 340 345 350
 Ser Tyr Ala Arg Ser Leu Lys Glu Ser Asn Lys Ile Asn Phe Ser Ser
 355 360 365
 Leu Gly Leu Thr Asp Glu Glu Lys Glu Ala Ala Glu His Phe Leu Asn
 370 375 380
 Met Ser Asp Asp Asn Gln Asp Asp Tyr Glu
 385 390

<210> 370

<211> 1185

<212> DNA

<213> human metapneumo virus

<400> 370

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 caacaagaaa taacactggt gtgtggagaa attctgtatg ctaaactatgc tgactacaaa 180
 tatgtctgcag aaataggaat acaatatatt agcacagctt taggatcaga gagagtgcag 240
 cagattctga ggaactcagg cagtgaagtc caagtgggtc taaccagaac gtactctctg 300
 gggaaaatta aaaacaataa aggagaagat ttacagatgt tagacatata cggggtagag 360
 aagagctggg tagaagagat agacaaaagaa gcaaggaaaa caatggcaac cttgcttaag 420
 gaatcatcag gtaatatccc acaaaatcag aggcctcag caccagacac acccataatc 480
 ttattatgtg taggtgcctt aatattcact aaactagcat caaccataga agtgggacta 540

| | | | | | | |
|-------------|-------------|------------|------------|------------|------------|------|
| gagaccacag | tcagaagggc | taaccgtgta | ctaagtgatg | cactcaagag | ataccctaga | 600 |
| atggacatac | caaagattgc | cagatccttc | tatgacttat | ttgaacaaaa | agtgtatcac | 660 |
| agaagtttgt | tcattgagta | tggcaaagca | ttaggtccat | catctacagg | cagcaaagca | 720 |
| gaaagtctat | ttgttaatat | attcatgcaa | gcttatgggg | ccggtcaaac | aatgctaagg | 780 |
| tgggggggtca | ttgccaggtc | atccaacaat | ataatgttag | gacatgtatc | cgtccaagct | 840 |
| gagttaaaac | aggtcacaga | agtctatgac | ttggtgcgag | aaatgggccc | tgaatctgga | 900 |
| cttctacatt | taaggcaaag | cccaaaagct | ggactgttat | cactagccaa | ctgtcccaac | 960 |
| tttgcaagtg | ttgttctcgg | aaatgcctca | ggcttaggca | taatcggtat | gtatcgaggg | 1020 |
| agagtaccaa | acacagaatt | attttcagca | gctgaaagtt | atgccaaaag | tttgaaagaa | 1080 |
| agcaataaaa | taaattttctc | ttcattagga | cttacagatg | aagagaaaga | ggctgcagaa | 1140 |
| catttcttaa | atgtgagtga | cgacagtcaa | aatgattatg | agtaa | | 1185 |

<210> 371

<211> 1185

<212> DNA

<213> human metapneumo virus

<400> 371

| | | | | | | |
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| tctcagtata | caataaagag | agatgtaggc | acaacaaccg | cagtgcacac | ctcatcattg | 120 |
| caacaagaaa | taacactatt | gtgtggagaa | attctatatg | ctaagcatgc | tgattacaaa | 180 |
| tatgctgcag | aaataggaat | acaatatatt | agcacagctc | taggatcaga | gagagtacag | 240 |
| cagattctaa | gaaactcagg | tagtgaagtc | caagtgggtt | taaccagaac | gtactccttg | 300 |
| gggaaagtta | aaaacaacaa | aggagaagat | ttacagatgt | tagacatata | cggagtagag | 360 |
| aaaagctggg | tggaagagat | agacaaaaga | gcaagaaaaa | caatggcaac | tttgcttaaa | 420 |
| gaatcatcag | gcaatattcc | acaaaatcag | aggccttcag | caccagacac | acccataatc | 480 |
| ttattatgtg | taggtgcctt | aatattttacc | aaactagcat | caactataga | agtgggatta | 540 |
| gagaccacag | tcagaagagc | taaccgtgta | ctaagtgatg | cactcaaaaag | ataccctagg | 600 |
| atggacatac | caaaaatcgc | tagatctttc | tatgacttat | ttgaacaaaa | agtgtattac | 660 |
| agaagtttgt | tcattgagta | tggcaaagca | ttaggtccat | cctctacagg | cagcaaagca | 720 |
| gaaagtttat | tcgttaatat | attcatgcaa | gcttacgggtg | ctgggtcaaac | aatgctgagg | 780 |
| tggggagtca | ttgccaggtc | atctaacaat | ataatgttag | gacatgtatc | tgttcaagct | 840 |
| gagttaaaac | aagtcacaga | agtctatgac | ctggtgcgag | aaatgggccc | tgaatctggg | 900 |
| ctcctacatt | taaggcaaag | cccaaaagct | ggactgttat | cactagccaa | ttgtcccaac | 960 |
| tttgctagtg | ttgttctcgg | caatgcctca | ggcttaggca | taatagggtat | gtatcgcgagg | 1020 |
| agagtgccaa | acacagaact | attttcagca | gcagaaaagct | atgccaaagag | tttgaaagaa | 1080 |
| agcaataaaa | ttaacttttc | ttcattagga | ctcacagatg | aagaaaaaga | ggctgcagaa | 1140 |
| cacttcctaa | atgtgagtga | cgacagtcaa | aatgattatg | agtaa | | 1185 |

<210> 372

<211> 1185

<212> DNA

<213> human metapneumo virus

<400> 372

| | | | | | | |
|-------------|-------------|------------|-------------|-------------|-------------|-----|
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| tctcaataca | caataaaaaag | agatgtaggc | accacaactg | cagtgcacac | ttcatcatta | 120 |
| caacaagaaa | taacactttt | gtgtggggaa | atacttttaca | ctaaacacac | tgattacaaa | 180 |
| tatgctgctg | agataggaat | acaatatatt | tgcacagctc | taggatcaga | aagagtacaa | 240 |
| cagattttga | gaaactcagg | tagtgaagtt | caggtgggtc | taaccaaaaac | atactcctta | 300 |
| gggaaaggca | aaaacagtaa | aggggaagag | ctgcagatgt | tagatatata | tggagtggaa | 360 |
| aagagttgga | tagaagaaat | agacaaaaga | gcagaaaaga | caatggtaac | tttgcttaag | 420 |
| gaatcatcag | gtaacatccc | acaaaaccag | agaccttcag | caccagacac | accaataatt | 480 |
| ttattatgtg | taggtgcctt | aatatttact | aaactagcat | caacaataga | agttggatta | 540 |
| gagactacag | ttagaagagc | taatagagtg | ctaagtgatg | cactcaaaaag | atacccaagg | 600 |
| atagatatata | caaagattgc | tagatctttt | tatgaactat | ttgaacaaaa | agtgtactac | 660 |
| agaagtttat | tcattgagta | cggaaaagct | ttaggtccat | cttcaacagg | aagcaaagca | 720 |
| gaaagtttgt | ttgtaaatat | atttatgcaa | gcttatggag | ctggccaaaac | actgctaagg | 780 |
| tgggggtgtca | ttgccagatc | atccaacaac | ataatgctag | ggcatgtatc | tgtgcaatct | 840 |
| gaattgaagc | aagttacaga | ggtttatgac | ttggtgagag | aaatgggtcc | tgaatctggg | 900 |
| ctttttacatc | taagacaaaag | tccaaaggca | gggctgttat | cattggccaa | ttgcccccaat | 960 |

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tttgctagtg ttgttcttgg caatgcttca ggtctaggca taatcggaat gtacagaggg 1020
agagtaccaa acacagagct attttctgca gcagaaagtt atgccagaag cttaaaaagaa 1080
agcaataaaa tcaacttctc ttcgttaggg cttacagatg aagaaaaaga agctgcagaa 1140
cacttcttaa acatgagtgg tgacaatcaa aatgattatg agtaa 1185

```

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<210> 373
<211> 1185
<212> DNA
<213> human metapneumo virus

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```

<400> 373
atgtctcttc aagggattca cctaagtgat ctgtcatata aacatgctat attaaaagag 60
tctcaataca caataaaaag agatgtaggc accacaactg cagtgcacacc ttcattcattg 120
cagcaagaga taacactttt gtgtggagag attctttaca ctaaacatac tgattacaaa 180
tatgctgcag agatagggat acaatatatt tgcacagctc taggatcaga aagagtacaa 240
cagatttttaa gaaattcagg tagtgagggt cagggtggtc taaccaagac atactcttta 300
gggaaaggta aaaatagtaa aggggaagag ttgcaaagt tagatataca tggagtggaa 360
aagagttggg tagaagaaat agacaaagag gcaagaaaaa caatggtgac tttgctaaag 420
gaatcatcag gcaacatccc acaaaaccag aggccttcag caccagacac accaataatt 480
ttattgtgtg taggtgcttt aatattcact aaactagcat caacaataga agttggacta 540
gagactacag ttagaagggc taacagagtg ttaagtgatg cgctcaaaaag ataccctagg 600
gtagatatac caaagattgc tagatctttt tatgaactat ttgagcagaa agtgtattac 660
aggagtctat tcattgagta tgggaaagct ttaggctcat cttcaacagg aagcaaagca 720
gaaagtttgt ttgtaaatat atttatgcaa gcttatggag ccggtcagac aatgctaagg 780
tgggggtgtc ttgccagatc atctaacaac ataatgctag ggcatgtatc tgtgcaagct 840
gaattgaaac aagttacaga ggtttatgat ttggtaaag aaatgggtcc tgaatctggg 900
cttttacatc taagacaaag tccaaaggca ggactgttat cgttgggctaa ttgccccaat 960
tttgctagtg ttgttcttgg taatgcttca ggtctaggta taatcggaat gtacagggga 1020
agagtgccaa acacagagct attttctgca gcagaaagtt atgccagaag cttaaaaagaa 1080
agcaacaaaa tcaacttctc ctcattaggg ctcacagacg aagaaaaaga agctgcagaa 1140
cacttcttaa acatgagtga tgacaatcaa gatgattatg agtaa 1185

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<210> 374
<211> 294
<212> PRT
<213> human metapneumo virus

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```

<400> 374
Met Ser Phe Pro Glu Gly Lys Asp Ile Leu Phe Met Gly Asn Glu Ala
1          5          10          15
Ala Lys Leu Ala Glu Ala Phe Gln Lys Ser Leu Arg Lys Pro Gly His
20          25          30
Lys Arg Ser Gln Ser Ile Ile Gly Glu Lys Val Asn Thr Val Ser Glu
35          40          45
Thr Leu Glu Leu Pro Thr Ile Ser Arg Pro Ala Lys Pro Thr Ile Pro
50          55          60
Ser Glu Pro Lys Leu Ala Trp Thr Asp Lys Gly Glu Ala Thr Lys Thr
65          70          75          80
Glu Ile Lys Gln Ala Ile Lys Val Met Asp Pro Ile Glu Glu Glu Glu
85          90          95
Ser Thr Glu Lys Lys Val Leu Pro Ser Ser Asp Gly Lys Thr Pro Ala
100          105          110
Glu Lys Lys Leu Lys Pro Ser Thr Asn Thr Lys Lys Lys Val Ser Phe
115          120          125
Thr Pro Asn Glu Pro Gly Lys Tyr Thr Lys Leu Glu Lys Asp Ala Leu
130          135          140
Asp Leu Leu Ser Asp Asn Glu Glu Asp Ala Glu Ser Ser Ile Leu
145          150          155          160
Thr Phe Glu Glu Arg Asp Thr Ser Ser Leu Ser Ile Glu Ala Arg Leu
165          170          175
Glu Ser Ile Glu Glu Lys Leu Ser Met Ile Leu Gly Leu Leu Arg Thr

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                180                185                190
Leu Asn Ile Ala Thr Ala Gly Pro Thr Ala Ala Arg Asp Gly Ile Arg
                195                200                205
Asp Ala Met Ile Gly Val Arg Glu Glu Leu Ile Ala Asp Ile Ile Lys
                210                215                220
Glu Ala Lys Gly Lys Ala Ala Glu Met Met Glu Glu Glu Met Ser Gln
225                230                235                240
Arg Ser Lys Ile Gly Asn Gly Ser Val Lys Leu Thr Glu Lys Ala Lys
                245                250                255
Glu Leu Asn Lys Ile Val Glu Asp Glu Ser Thr Ser Gly Glu Ser Glu
                260                265                270
Glu Glu Glu Glu Pro Lys Asp Thr Gln Asp Asn Ser Gln Glu Asp Asp
                275                280                285
Ile Tyr Gln Leu Ile Met
                290

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<210> 375

<211> 294

<212> PRT

<213> human metapneumo virus

<400> 375

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Met Ser Phe Pro Glu Gly Lys Asp Ile Leu Phe Met Gly Asn Glu Ala
 1                5                10                15
Ala Lys Leu Ala Glu Ala Phe Gln Lys Ser Leu Arg Lys Pro Asn His
                20                25                30
Lys Arg Ser Gln Ser Ile Ile Gly Glu Lys Val Asn Thr Val Ser Glu
35                40                45
Thr Leu Glu Leu Pro Thr Ile Ser Arg Pro Thr Lys Pro Thr Ile Leu
50                55                60
Ser Glu Pro Lys Leu Ala Trp Thr Asp Lys Gly Gly Ala Ile Lys Thr
65                70                75                80
Glu Ala Lys Gln Thr Ile Lys Val Met Asp Pro Ile Glu Glu Glu Glu
                85                90                95
Phe Thr Glu Lys Arg Val Leu Pro Ser Ser Asp Gly Lys Thr Pro Ala
100                105                110
Glu Lys Lys Leu Lys Pro Ser Thr Asn Thr Lys Lys Lys Val Ser Phe
115                120                125
Thr Pro Asn Glu Pro Gly Lys Tyr Thr Lys Leu Glu Lys Asp Ala Leu
130                135                140
Asp Leu Leu Ser Asp Asn Glu Glu Glu Asp Ala Glu Ser Ser Ile Leu
145                150                155                160
Thr Phe Glu Glu Arg Asp Thr Ser Ser Leu Ser Ile Glu Ala Arg Leu
165                170                175
Glu Ser Ile Glu Glu Lys Leu Ser Met Ile Leu Gly Leu Leu Arg Thr
180                185                190
Leu Asn Ile Ala Thr Ala Gly Pro Thr Ala Ala Arg Asp Gly Ile Arg
195                200                205
Asp Ala Met Ile Gly Ile Arg Glu Glu Leu Ile Ala Asp Ile Ile Lys
210                215                220
Glu Ala Lys Gly Lys Ala Ala Glu Met Met Glu Glu Glu Met Asn Gln
225                230                235                240
Arg Thr Lys Ile Gly Asn Gly Ser Val Lys Leu Thr Glu Lys Ala Lys
245                250                255
Glu Leu Asn Lys Ile Val Glu Asp Glu Ser Thr Ser Gly Glu Ser Glu
260                265                270
Glu Glu Glu Glu Pro Lys Asp Thr Gln Glu Asn Asn Gln Glu Asp Asp
275                280                285
Ile Tyr Gln Leu Ile Met
290

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<210> 376
 <211> 294
 <212> PRT
 <213> human metapneumo virus

<400> 376
 Met Ser Phe Pro Glu Gly Lys Asp Ile Leu Phe Met Gly Asn Glu Ala
 1 5 10 15
 Ala Lys Ile Ala Glu Ala Phe Gln Lys Ser Leu Lys Lys Ser Gly His
 20 25 30
 Lys Arg Thr Gln Ser Ile Val Gly Glu Lys Val Asn Thr Ile Ser Glu
 35 40 45
 Thr Leu Glu Leu Pro Thr Ile Ser Lys Pro Ala Arg Ser Ser Thr Leu
 50 55 60
 Leu Glu Pro Lys Leu Ala Trp Ala Asp Asn Ser Gly Ile Thr Lys Ile
 65 70 75 80
 Thr Glu Lys Pro Ala Thr Lys Thr Thr Asp Pro Val Glu Glu Glu Glu
 85 90 95
 Phe Asn Glu Lys Lys Val Leu Pro Ser Ser Asp Gly Lys Thr Pro Ala
 100 105 110
 Glu Lys Lys Ser Lys Phe Ser Thr Ser Val Lys Lys Lys Val Ser Phe
 115 120 125
 Thr Ser Asn Glu Pro Gly Lys Tyr Thr Lys Leu Glu Lys Asp Ala Leu
 130 135 140
 Asp Leu Leu Ser Asp Asn Glu Glu Glu Asp Ala Glu Ser Ser Ile Leu
 145 150 155 160
 Thr Phe Glu Glu Lys Asp Thr Ser Ser Leu Ser Ile Glu Ala Arg Leu
 165 170 175
 Glu Ser Ile Glu Glu Lys Leu Ser Met Ile Leu Gly Leu Leu Arg Thr
 180 185 190
 Leu Asn Ile Ala Thr Ala Gly Pro Thr Ala Ala Arg Asp Gly Ile Arg
 195 200 205
 Asp Ala Met Ile Gly Ile Arg Glu Glu Leu Ile Ala Glu Ile Ile Lys
 210 215 220
 Glu Ala Lys Gly Lys Ala Ala Glu Met Met Glu Glu Met Asn Gln
 225 230 235 240
 Arg Ser Lys Ile Gly Asn Gly Ser Val Lys Leu Thr Glu Lys Ala Lys
 245 250 255
 Glu Leu Asn Lys Ile Val Glu Asp Glu Ser Thr Ser Gly Glu Ser Glu
 260 265 270
 Glu Glu Glu Glu Pro Lys Glu Thr Gln Asp Asn Asn Gln Gly Glu Asp
 275 280 285
 Ile Tyr Gln Leu Ile Met
 290

<210> 377
 <211> 294
 <212> PRT
 <213> human metapneumo virus

<400> 377
 Met Ser Phe Pro Glu Gly Lys Asp Ile Leu Phe Met Gly Asn Glu Ala
 1 5 10 15
 Ala Lys Ile Ala Glu Ala Phe Gln Lys Ser Leu Lys Arg Ser Gly His
 20 25 30
 Lys Arg Thr Gln Ser Ile Val Gly Glu Lys Val Asn Thr Ile Ser Glu
 35 40 45
 Thr Leu Glu Leu Pro Thr Ile Ser Lys Pro Ala Arg Ser Ser Thr Leu

| | | | | |
|---|-----|-----|-----|-----|
| 50 | | 55 | | 60 |
| Leu Glu Pro Lys Leu Ala Trp Ala Asp Ser Ser Gly Ala Thr Lys Thr | | | | |
| 65 | 70 | 75 | 80 | |
| Thr Glu Lys Gln Thr Thr Lys Thr Thr Asp Pro Val Glu Glu Glu Glu | | | | |
| | 85 | 90 | 95 | |
| Leu Asn Glu Lys Lys Val Ser Pro Ser Ser Asp Gly Lys Thr Pro Ala | | | | |
| | 100 | 105 | 110 | |
| Glu Lys Lys Ser Lys Ser Pro Thr Asn Val Lys Lys Lys Val Ser Phe | | | | |
| | 115 | 120 | 125 | |
| Thr Ser Asn Glu Pro Gly Lys Tyr Thr Lys Leu Glu Lys Asp Ala Leu | | | | |
| | 130 | 135 | 140 | |
| Asp Leu Leu Ser Asp Asn Glu Glu Glu Asp Ala Glu Ser Ser Ile Leu | | | | |
| | 145 | 150 | 155 | 160 |
| Thr Phe Glu Glu Arg Asp Thr Ser Ser Leu Ser Ile Glu Ala Arg Leu | | | | |
| | 165 | 170 | 175 | |
| Glu Ser Ile Glu Glu Lys Leu Ser Met Ile Leu Gly Leu Leu Arg Thr | | | | |
| | 180 | 185 | 190 | |
| Leu Asn Ile Ala Thr Ala Gly Pro Thr Ala Ala Arg Asp Gly Ile Arg | | | | |
| | 195 | 200 | 205 | |
| Asp Ala Met Ile Gly Ile Arg Glu Glu Leu Ile Ala Glu Ile Ile Lys | | | | |
| | 210 | 215 | 220 | |
| Glu Ala Lys Gly Lys Ala Ala Glu Met Met Glu Glu Glu Met Asn Gln | | | | |
| | 225 | 230 | 235 | 240 |
| Arg Ser Lys Ile Gly Asn Gly Ser Val Lys Leu Thr Glu Lys Ala Lys | | | | |
| | 245 | 250 | 255 | |
| Glu Leu Asn Lys Ile Val Glu Asp Glu Ser Thr Ser Gly Glu Ser Glu | | | | |
| | 260 | 265 | 270 | |
| Glu Glu Glu Glu Pro Lys Glu Thr Gln Asp Asn Asn Gln Gly Glu Asp | | | | |
| | 275 | 280 | 285 | |
| Ile Tyr Gln Leu Ile Met | | | | |
| 290 | | | | |

<210> 378
 <211> 885
 <212> DNA
 <213> human metapneumo virus

<400> 378
 atgtcattcc ctgaaggaaa agatattctt ttcattgggta atgaagcagc aaaatttagca 60
 gaagctttcc agaaatcatt aagaaaacca gggtcataaaa gatctcaatc tattatagga 120
 gaaaaagtga atactgtatc agaaacattg gaattaccta ctatcagtag acctgcaaaa 180
 ccaaccatac cgtcagaacc aaagtttagca tggacagata aaggtggggc aaccaaact 240
 gaaataaagc aagcaatcaa agtcatggat cccattgaag aagaagagtc taccgagaag 300
 aaggtgctac cctccagtga tgggaaaacc cctgcagaaa agaaactgaa accatcaact 360
 aacacaaaaa agaagggttc atttacacca aatgaaccag ggaaatatac aaagttggaa 420
 aaagatgctc tagatttgct ctcagataat gaagaagaag atgcagaatc ttcaatctta 480
 acctttgaag aaagagatac ttcattcatta agcattgagg ccagattgga atcaatagag 540
 gagaaattaa gcatgatatt agggctatta agaacactca acattgctac agcaggaccc 600
 acagcagcaa gagatgggat cagagatgca atgattggcg taagagagga attaatagca 660
 gacataataa aggaagctaa agggaaagca gcagaaatga tggagagga aatgagtcaa 720
 cgatcaaaaa taggaaatgg tagtgtaaaa ttaacagaaa aagcaaaaga gctcaacaaa 780
 attgttgaag atgaaagcac aagtggagaa tccgaagaag aagaagaacc aaaagacaca 840
 caagacaata gtcaagaaga tgacatttac cagttaatta tgtag 885

<210> 379
 <211> 885
 <212> DNA
 <213> human metapneumo virus

<400> 379

| | | | | | | |
|-------------|------------|-------------|------------|------------|------------|-----|
| atgtcattcc | ctgaaggaaa | agatattctt | ttcatgggta | atgaagcagc | aaaattggca | 60 |
| gaagcttttc | aaaaatcatt | aagaaaacct | aatcataaaa | gatctcaatc | tattatagga | 120 |
| gaaaaagtga | acactgtatc | tgaacatttg | gaattaccta | ctatcagtag | acctaccaa | 180 |
| ccgaccatat | tgtagagcc | gaagtttagca | tggacagaca | aaggtggggc | aatcaaaact | 240 |
| gaagcaaaagc | aaacaatcaa | agttatggat | cctattgaag | aagaagagtt | tactgagaaa | 300 |
| aggggtgctgc | cctccagtga | tgggaaaact | cctgcagaaa | agaagttgaa | accatcaacc | 360 |
| aacactaaaa | agaaggtctc | atttacacca | aatgaaccag | gaaaatacac | aaagttggag | 420 |
| aaagatgctc | tagacttgct | ttcagacaat | gaagaagaag | atgcagaatc | ctcaatctta | 480 |
| accttcgaag | aaagagatac | ttcatcatta | agcattgaag | ccagactaga | atcgattgag | 540 |
| gagaaaattaa | gcatgatatt | agggctatta | agaacactca | acattgctac | agcaggaccc | 600 |
| acagcagcaa | gagatgggat | cagagatgca | atgattggca | taagggagga | actaatagca | 660 |
| gacataataa | aagaagccaa | gggaaaagca | gcagaaatga | tggagaaga | aatgaaccag | 720 |
| cggacaaaaa | taggaaacgg | tagtgtaaaa | ttaactgaaa | aggcaaagga | gctcaacaaa | 780 |
| attgttgaag | acgaaagcac | aagtggtgaa | tccgaagaag | aagaagaacc | aaaagacaca | 840 |
| caggaaaata | atcaagaaga | tgacatttac | cagttaatta | tgtag | | 885 |

<210> 380

<211> 885

<212> DNA

<213> human metapneumo virus

<400> 380

| | | | | | | |
|------------|------------|------------|------------|-------------|------------|-----|
| atgtcattcc | ctgaaggaaa | ggatattctg | ttcatgggta | atgaagcagc | aaaaatagcc | 60 |
| gaagcttttc | agaaatcact | gaaaaaatca | ggtcacaaga | gaactcaatc | tattgtaggg | 120 |
| gaaaaagtta | acactatatc | agaaactcta | gaactaccta | ccatcagcaa | acctgcacga | 180 |
| tcatctacac | tgctggaacc | aaaattggca | tgggcagaca | acagcggaat | cacaaaaatc | 240 |
| acagaaaaac | cagcaaccaa | aacaacagat | cctggtgaag | aagaggaatt | caatgaaaag | 300 |
| aaagtgttac | cttccagtga | tgggaagact | cctgcagaga | aaaaatcaaa | gttttcaacc | 360 |
| agtgtaaaaa | agaaagtttc | ctttacatca | aatgaaccag | ggaaatacac | caaactagag | 420 |
| aaagatgccc | tagatttgct | ctcagacaat | gaggaagaag | acgcagaatc | ctcaatccta | 480 |
| acttttgagg | agaaagatac | atcatcacta | agcattgaag | ctagactaga | atctatagaa | 540 |
| gagaagttga | gcatgatatt | aggactgctt | cgtacactta | acattgcaac | agcaggacca | 600 |
| acagctgcac | gagatggaat | tagggatgca | atgattggta | taagagaaga | gctaatagca | 660 |
| gagataatta | aggaagccaa | gggaaaagca | gctgaaatga | tggagaaga | gatgaatcaa | 720 |
| agatcaaaaa | taggaaatgg | cagtgtaaaa | ctaaccgaga | aggcaaaaaga | gctcaacaaa | 780 |
| attgttgaag | acgagagcac | aagcggtgaa | tcagaagaag | aagaagaacc | aaaagaaact | 840 |
| caggataaca | atcaaggaga | agatatttat | cagttaatca | tgtag | | 885 |

<210> 381

<211> 885

<212> DNA

<213> human metapneumo virus

<400> 381

| | | | | | | |
|-------------|-------------|------------|------------|-------------|------------|-----|
| atgtcattcc | ctgaaggaaa | agatatcctg | ttcatgggta | atgaagcagc | aaaaatagca | 60 |
| gaagcttttc | agaaatcact | aaaaagatca | ggtcacaaaa | gaaccagtc | tattgtaggg | 120 |
| gaaaaagtta | acactatatc | agaaactcta | gagctaccta | ccatcagcaa | acctgcacga | 180 |
| tcatctacac | tgctagagcc | aaaattggca | tgggcagaca | gcagcggagc | cacaaaaacc | 240 |
| acagaaaaac | aaacaaccaa | aacaacagat | cctggtgaag | aagaggaact | caatgaaaag | 300 |
| aaggtatcac | cttccagtga | tgggaagact | cctgcagaga | aaaaatcaaa | atctccaacc | 360 |
| aatgtaaaaa | agaaagtttc | cttcacatca | aatgaaccag | ggaaatatac | taaactagaa | 420 |
| aaagatgccc | tagatttgct | ctcagacaat | gaggaagaag | acgcagagtc | ctcaatccta | 480 |
| acctttggaag | agagagacac | atcatcacta | agcattgagg | ctagactaga | atcaatagaa | 540 |
| gagaagctaa | gcatgatatt | aggactgctt | cgtacactta | acattgcaac | agcaggacca | 600 |
| acggctgcaa | gggatggaat | cagagatgca | atgattggta | taagagaaga | actaatagca | 660 |
| gaaataataa | aagaagcaaa | gggaaaagca | gccgaaatga | tggaaagagga | aatgaatcaa | 720 |
| aggtcaaaaa | taggtaaatgg | cagtgtaaaa | ctaaccgaga | aggcaaaaaga | acttaataaa | 780 |
| attgttgaag | acgagagcac | aagtggtgaa | tcagaagaag | aagaagaacc | aaaagaaact | 840 |
| caggataaca | atcaaggaga | agatatctac | cagttaatca | tgtag | | 885 |

<210> 382

<211> 183
 <212> PRT
 <213> human metapneumo virus

<400> 382
 Met Ile Thr Leu Asp Val Ile Lys Ser Asp Gly Ser Ser Lys Thr Cys
 1 5 10 15
 Thr His Leu Lys Lys Ile Ile Lys Asp His Ser Gly Lys Val Leu Ile
 20 25 30
 Val Leu Lys Leu Ile Leu Ala Leu Thr Phe Leu Thr Val Thr Ile
 35 40 45
 Thr Ile Asn Tyr Ile Lys Val Glu Asn Asn Leu Gln Ile Cys Gln Ser
 50 55 60
 Lys Thr Glu Ser Asp Lys Lys Asp Ser Ser Ser Asn Thr Thr Ser Val
 65 70 75 80
 Thr Thr Lys Thr Thr Leu Asn His Asp Ile Thr Gln Tyr Phe Lys Ser
 85 90 95
 Leu Ile Gln Arg Tyr Thr Asn Ser Ala Ile Asn Ser Asp Thr Cys Trp
 100 105 110
 Lys Ile Asn Arg Asn Gln Cys Thr Asn Ile Thr Thr Tyr Lys Phe Leu
 115 120 125
 Cys Phe Lys Ser Glu Asp Thr Lys Thr Asn Asn Cys Asp Lys Leu Thr
 130 135 140
 Asp Leu Cys Arg Asn Lys Pro Lys Pro Ala Val Gly Val Tyr His Ile
 145 150 155 160
 Val Glu Cys His Cys Ile Tyr Thr Val Lys Trp Lys Cys Tyr His Tyr
 165 170 175
 Pro Thr Asp Glu Thr Gln Ser
 180

<210> 383
 <211> 179
 <212> PRT
 <213> human metapneumo virus

<400> 383
 Met Ile Thr Leu Asp Val Ile Lys Ser Asp Gly Ser Ser Lys Thr Cys
 1 5 10 15
 Thr His Leu Lys Lys Ile Ile Lys Asp His Ser Gly Lys Val Leu Ile
 20 25 30
 Ala Leu Lys Leu Ile Leu Ala Leu Thr Phe Phe Thr Ile Thr Ile
 35 40 45
 Thr Ile Asn Tyr Ile Lys Val Glu Asn Asn Leu Gln Ile Cys Gln Ser
 50 55 60
 Lys Thr Glu Ser Asp Lys Glu Asp Ser Pro Ser Asn Thr Thr Ser Val
 65 70 75 80
 Thr Thr Lys Thr Thr Leu Asp His Asp Ile Thr Gln Tyr Phe Lys Arg
 85 90 95
 Leu Ile Gln Arg Tyr Thr Asp Ser Val Ile Asn Lys Asp Thr Cys Trp
 100 105 110
 Lys Ile Ser Arg Asn Gln Cys Thr Asn Ile Thr Thr Tyr Lys Phe Leu
 115 120 125
 Cys Phe Lys Pro Glu Asp Ser Lys Ile Asn Ser Cys Asp Arg Leu Thr
 130 135 140
 Asp Leu Cys Arg Asn Lys Ser Lys Ser Ala Ala Glu Ala Tyr His Thr
 145 150 155 160
 Val Glu Cys His Cys Ile Tyr Thr Ile Glu Trp Lys Cys Tyr His His
 165 170 175
 Pro Ile Asp

<210> 384
 <211> 177
 <212> PRT
 <213> human metapneumo virus

<400> 384
 Met Lys Thr Leu Asp Val Ile Lys Ser Asp Gly Ser Ser Glu Thr Cys
 1 5 10 15
 Asn Gln Leu Lys Lys Ile Ile Lys Lys His Ser Gly Lys Val Leu Ile
 20 25 30
 Ala Leu Lys Leu Ile Leu Ala Leu Leu Thr Phe Phe Thr Ala Thr Ile
 35 40 45
 Thr Val Asn Tyr Ile Lys Val Glu Asn Asn Leu Gln Ala Cys Gln Pro
 50 55 60
 Lys Asn Glu Ser Asp Lys Lys Val Thr Lys Pro Asn Thr Thr Ser Thr
 65 70 75 80
 Thr Ile Arg Pro Thr Pro Asp Pro Thr Val Val His His Leu Lys Arg
 85 90 95
 Leu Ile Gln Arg His Thr Asn Ser Val Thr Lys Asp Ser Asp Thr Cys
 100 105 110
 Trp Arg Ile His Lys Asn Gln Arg Thr Asn Ile Lys Ile Tyr Lys Phe
 115 120 125
 Leu Cys Ser Gly Phe Thr Asn Ser Lys Gly Thr Asp Cys Glu Glu Pro
 130 135 140
 Thr Ala Leu Cys Asp Lys Lys Leu Lys Thr Ile Val Glu Lys His Arg
 145 150 155 160
 Lys Ala Glu Cys His Cys Leu His Thr Thr Glu Trp Gly Cys Leu His
 165 170 175
 Pro

<210> 385
 <211> 177
 <212> PRT
 <213> human metapneumo virus

<400> 385
 Met Lys Thr Leu Asp Val Ile Lys Ser Asp Gly Ser Ser Glu Thr Cys
 1 5 10 15
 Asn Gln Leu Lys Lys Ile Ile Lys Lys His Ser Gly Lys Leu Leu Ile
 20 25 30
 Ala Leu Lys Leu Ile Leu Ala Leu Leu Thr Phe Phe Thr Val Thr Ile
 35 40 45
 Thr Val Asn Tyr Ile Lys Val Glu Asn Asn Leu Gln Ala Cys Gln Leu
 50 55 60
 Lys Asn Glu Ser Asp Lys Lys Asp Thr Lys Leu Asn Thr Thr Ser Thr
 65 70 75 80
 Thr Ile Arg Pro Ile Pro Asp Leu Asn Ala Val Gln Tyr Leu Lys Arg
 85 90 95
 Leu Ile Gln Lys His Thr Asn Phe Val Ile Lys Asp Arg Asp Thr Cys
 100 105 110
 Trp Arg Ile His Thr Asn Gln Cys Thr Asn Ile Lys Ile Tyr Lys Phe
 115 120 125
 Leu Cys Phe Gly Phe Met Asn Ser Thr Asn Thr Asp Cys Glu Glu Leu
 130 135 140
 Thr Val Leu Cys Asp Lys Lys Ser Lys Thr Met Thr Glu Lys His Arg
 145 150 155 160
 Lys Ala Glu Cys His Cys Leu His Thr Thr Glu Trp Trp Cys Tyr Tyr

Leu

165 170 175

<210> 386
 <211> 552
 <212> DNA
 <213> human metapneumo virus

<400> 386
 atgataacat tagatgtcat taaaagtgat gggctcttcaa aaacatgtac tcacctcaaa 60
 aaaataatta aagaccactc tggtaaagtg cttattgtac ttaagttaat attagcttta 120
 ctaacatttc tcacagtaac aatcaccatc aattatataa aagtggaaaa caatctgcaa 180
 atatgccagt caaaaactga atcagacaaa aaggactcat catcaaatac cacatcagtc 240
 acaaccaaga ctactctaaa tcatgatatc acacagtatt ttaaaagttt gattcaaagg 300
 tatacaaaact ctgcaataaa cagtgcacaca tgctggaaaa taaacagaaa tcaatgcaca 360
 aatataacaa catacaaatt tttatgtttt aaatctgaag acacaaaaaac caacaattgt 420
 gataaactga cagatttatg cagaaacaaa ccaaaaccag cagttggagt gtatcacata 480
 gtagaatgcc attgtatata cacagttaaa tggaagtgc atcattaccc aaccgatgaa 540
 acccaatcct aa 552

<210> 387
 <211> 540
 <212> DNA
 <213> human metapneumo virus

<400> 387
 atgataacat tagatgtcat taaaagtgat gggctcttcaa aaacatgtac tcacctcaaa 60
 aaaataatca aagaccattc tggtaaagtg cttattgcac ttaagttaat attagcttta 120
 ctaacatttt tcacaataac aatcactata aattacataa aagtagaaaa caatctacaa 180
 atatgccagt caaaaactga atcagacaaa gaagactcac catcaaatac cacatccgtc 240
 acaaccaaga ctactctaga ccatgatata acacagtatt ttaaaagatt aattcaaagg 300
 tatacagatt ctgtgataaa caaggacaca tgctggaaaa taagcagaaa tcaatgcaca 360
 aatataacaa catataaatt tttatgcttt aaacctgagg actcaaaaaat caacagttgt 420
 gatagactga cagatctatg cagaaacaaa tcaaaatcag cagctgaagc atatcatata 480
 gtagaatgcc attgcatata cacaattgag tggaagtgc atcaccaccc aatagattaa 540

<210> 388
 <211> 534
 <212> DNA
 <213> human metapneumo virus

<400> 388
 atgaaaacat tagatgtcat aaaaagtgat ggatcctcag aaacgtgtaa tcaactcaaa 60
 aaaataataa aaaaacactc aggtaaagtg cttattgcac taaaactgat attggcctta 120
 ctgacatttt tcacagcaac aatcactgtc aactatataa aagtagaaaa caatttgcag 180
 gcatgtcaac caaaaaatga atcagacaaa aagggtcaca agccaaatac cacatcaaca 240
 acaatcagac ccacaccga tccaactgta gtacatcatt tgaaaaggct gattcagaga 300
 cacaccaact ctgtcacaaa agacagcgat acttggttga gaatacacaa gaatcaacgt 360
 acaaatataa aaatatacaa gttcttatgc tctgggttca caaattcaaa aggtacagat 420
 tgtgaggaac caacagccct atgcgacaaa aagttaaaaa ccatagtaga aaaacataga 480
 aaagcagaat gtcactgtct acatacaacc gagtgggggt gccttcatcc cttaa 534

<210> 389
 <211> 534
 <212> DNA
 <213> human metapneumo virus

<400> 389

```

atgaaaacat tagatgtcat aaaaagtgat ggatcctcag aaacatgtaa tcaactcaaa 60
aaaataataa aaaaacactc aggtaaattg cttattgcat taaaactgat attggcctta 120
ttgacgtttt tcacagtaac aattactgtt aactatataa aagtagaaaa caatttgcag 180
gcatgtcaat taataaatga atcagacaaa aaggacacaa agctaaatac cacatcaaca 240
acaatcagac ccattcctga tctaaatgca gtacagtact tgaaaaggct gattcagaaa 300
cacaccaact ttgtcataaa agacagagat acctgttgga gaatacacac gaatcaatgc 360
acaaatataa aaatatataa gttcttatgt ttcgggttta tgaattcaac aaatacagac 420
tgtgaagaac taacagtttt atgtgataaa aagtcaaaaa ccatgacaga aaaacatagg 480
aaagcagagt gtcactgtct acatacaacc gagtggtggg gttattatct ttaa 534

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<210> 390

<211> 298

<212> PRT

<213> Human respiratory syncytial virus

<220>

<223> attachment glycoprotein of Human respiratory syncytial virus

<400> 390

```

Met Ser Lys Thr Lys Asp Gln Arg Thr Ala Lys Thr Leu Glu Arg Thr
 1           5           10          15
Trp Asp Thr Leu Asn His Leu Leu Phe Ile Ser Ser Cys Leu Tyr Lys
          20          25          30
Leu Asn Leu Lys Ser Ile Ala Gln Ile Thr Leu Ser Ile Leu Ala Met
          35          40          45
Ile Ile Ser Thr Ser Leu Ile Ile Ala Ala Ile Ile Phe Ile Ala Ser
          50          55          60
Ala Asn His Lys Val Thr Leu Thr Thr Ala Ile Ile Gln Asp Ala Thr
65          70          75          80
Asn Gln Ile Lys Asn Thr Thr Pro Thr Tyr Leu Thr Gln Asn Pro Gln
          85          90          95
Leu Gly Ile Ser Phe Ser Asn Leu Ser Glu Thr Thr Ser Gln Pro Ile
          100         105         110
Thr Ile Leu Ala Ser Thr Thr Pro Ser Ala Glu Ser Thr Pro Gln Ser
          115         120         125
Thr Thr Val Lys Thr Lys Asn Thr Thr Thr Thr Gln Ile Gln Pro Ser
          130         135         140
Lys Ser Thr Thr Lys Gln Arg Gln Asn Lys Pro Gln Asn Lys Pro Asn
145         150         155         160
Asn Asp Phe His Phe Glu Val Phe Asn Phe Val Pro Cys Ser Ile Cys
          165         170         175
Ser Asn Asn Pro Thr Cys Trp Ala Ile Cys Lys Arg Ile Pro Asn Lys
          180         185         190
Lys Pro Gly Lys Lys Thr Thr Thr Lys Pro Thr Lys Lys Pro Thr Ile
          195         200         205
Lys Thr Thr Lys Lys Asp Leu Lys Pro Gln Thr Thr Lys Ser Lys Glu
          210         215         220
Val Leu Thr Thr Lys Pro Thr Glu Lys Pro Thr Ile Asn Thr Thr Lys
225         230         235         240
Thr Asn Ile Arg Thr Thr Leu Leu Ile Ser Asn Thr Thr Gly Asn Pro
          245         250         255
Glu His Thr Ser Gln Lys Glu Thr Leu His Ser Thr Thr Ser Glu Gly
          260         265         270
Asn Pro Ser Pro Ser Gln Val Tyr Thr Thr Ser Glu Tyr Leu Ser Gln
          275         280         285
Ser Leu Ser Pro Ser Asn Thr Thr Tyr Tyr
          290         295

```

<210> 391

<211> 574
 <212> PRT
 <213> Human respiratory syncytial virus

<220>
 <223> fusion glycoprotein of Human respiratory syncytial virus

<400> 391

```

Met Glu Leu Pro Ile Leu Lys Ala Asn Ala Ile Thr Thr Ile Leu Ala
 1          5          10          15
Ala Val Thr Leu Cys Phe Val Ser Ser Gln Asn Ile Thr Glu Glu Phe
          20          25          30
Tyr Gln Ser Thr Cys Ser Ala Val Ser Lys Gly Tyr Leu Ser Ala Leu
          35          40          45
Arg Thr Gly Trp Tyr Thr Ser Val Ile Thr Ile Glu Leu Ser Asn Ile
          50          55          60
Lys Glu Asn Lys Cys Asn Gly Thr Asp Ala Lys Val Lys Leu Ile Lys
65          70          75          80
Gln Glu Leu Asp Lys Tyr Lys Asn Ala Val Thr Glu Leu Gln Leu Leu
          85          90          95
Met Gln Ser Thr Pro Ala Ala Asn Asn Arg Ala Arg Arg Glu Leu Pro
          100          105          110
Arg Phe Met Asn Tyr Thr Leu Asn Asn Thr Lys Asn Thr Asn Val Thr
          115          120          125
Leu Ser Lys Lys Arg Lys Arg Arg Phe Leu Gly Phe Leu Leu Gly Val
          130          135          140
Gly Ser Ala Ile Ala Ser Gly Ile Ala Val Ser Lys Val Leu His Leu
145          150          155          160
Glu Gly Glu Val Asn Lys Ile Lys Ser Ala Leu Leu Ser Thr Asn Lys
          165          170          175
Ala Val Val Ser Leu Ser Asn Gly Val Ser Val Leu Thr Ser Lys Val
          180          185          190
Leu Asp Leu Lys Asn Tyr Ile Asp Lys Gln Leu Leu Pro Ile Val Asn
          195          200          205
Lys Gln Ser Cys Ser Ile Ser Asn Ile Glu Thr Val Ile Glu Phe Gln
210          215          220
Gln Lys Asn Asn Arg Leu Leu Glu Ile Thr Arg Glu Phe Ser Val Asn
225          230          235          240
Ala Gly Val Thr Thr Pro Val Ser Thr Tyr Met Leu Thr Asn Ser Glu
          245          250          255
Leu Leu Ser Leu Ile Asn Asp Met Pro Ile Thr Asn Asp Gln Lys Lys
          260          265          270
Leu Met Ser Asn Asn Val Gln Ile Val Arg Gln Gln Ser Tyr Ser Ile
          275          280          285
Met Ser Ile Ile Lys Glu Glu Val Leu Ala Tyr Val Val Gln Leu Pro
290          295          300
Leu Tyr Gly Val Ile Asp Thr Pro Cys Trp Lys Leu His Thr Ser Pro
305          310          315          320
Leu Cys Thr Thr Asn Thr Lys Glu Gly Ser Asn Ile Cys Leu Thr Arg
          325          330          335
Thr Asp Arg Gly Trp Tyr Cys Asp Asn Ala Gly Ser Val Ser Phe Phe
          340          345          350
Pro Gln Ala Glu Thr Cys Lys Val Gln Ser Asn Arg Val Phe Cys Asp
          355          360          365
Thr Met Asn Ser Leu Thr Leu Pro Ser Glu Val Asn Leu Cys Asn Val
370          375          380
Asp Ile Phe Asn Pro Lys Tyr Asp Cys Lys Ile Met Thr Ser Lys Thr
385          390          395          400
Asp Val Ser Ser Ser Val Ile Thr Ser Leu Gly Ala Ile Val Ser Cys
          405          410          415
Tyr Gly Lys Thr Lys Cys Thr Ala Ser Asn Lys Asn Arg Gly Ile Ile

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          420          425          430
Lys Thr Phe Ser Asn Gly Cys Asp Tyr Val Ser Asn Lys Gly Val Asp
          435          440          445
Thr Val Ser Val Gly Asn Thr Leu Tyr Tyr Val Asn Lys Gln Glu Gly
          450          455          460
Lys Asn Leu Tyr Val Lys Gly Glu Pro Ile Ile Asn Phe Tyr Asp Pro
465          470          475          480
Leu Val Phe Pro Ser Asp Glu Phe Asp Ala Ser Ile Ser Gln Val Asn
          485          490          495
Glu Lys Ile Asn Gln Ser Leu Ala Phe Ile Arg Lys Ser Asp Glu Leu
          500          505          510
Leu His Asn Val Asn Ala Gly Lys Ser Thr Thr Asn Ile Met Ile Thr
          515          520          525
Thr Ile Ile Ile Val Ile Ile Val Ile Leu Leu Ser Leu Ile Ala Val
          530          535          540
Gly Leu Leu Leu Tyr Cys Lys Ala Arg Ser Thr Pro Val Thr Leu Ser
545          550          555          560
Lys Asp Gln Leu Ser Gly Ile Asn Asn Ile Ala Phe Ser Ser
          565          570

```

<210> 392
 <211> 64
 <212> PRT
 <213> Human respiratory syncytial virus

<220>
 <223> small hydrophobic protein of Human respiratory syncytial virus

```

<400> 392
Met Glu Asn Thr Ser Ile Thr Ile Glu Phe Ser Ser Lys Phe Trp Pro
  1          5          10          15
Tyr Phe Thr Leu Ile His Met Ile Thr Thr Ile Ile Ser Leu Leu Ile
          20          25          30
Ile Ile Ser Ile Met Ile Ala Ile Leu Asn Lys Leu Cys Glu Tyr Asn
          35          40          45
Ala Phe His Asn Lys Thr Phe Glu Leu Pro Arg Ala Arg Ile Asn Thr
          50          55          60

```

<210> 393
 <211> 2165
 <212> PRT
 <213> Human respiratory syncytial virus (strain A2)

<220>
 <223> RNA polymerase beta subunit (Large structural protein) (L protein)
 of Human respiratory syncytial virus

```

<400> 393
Met Asp Pro Ile Ile Asn Gly Asn Ser Ala Asn Val Tyr Leu Thr Asp
  1          5          10          15
Ser Tyr Leu Lys Gly Val Ile Ser Phe Ser Glu Cys Asn Ala Leu Gly
          20          25          30
Ser Tyr Ile Phe Asn Gly Pro Tyr Leu Lys Asn Asp Tyr Thr Asn Leu
          35          40          45
Ile Ser Arg Gln Asn Pro Leu Ile Glu His Met Asn Leu Lys Lys Leu
          50          55          60
Asn Ile Thr Gln Ser Leu Ile Ser Lys Tyr His Lys Gly Glu Ile Lys
65          70          75          80
Leu Glu Glu Pro Thr Tyr Phe Gln Ser Leu Leu Met Thr Tyr Lys Ser

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| | | | | | | | | | | | | | | | | |
|------|------|-----|-----|------|------|------|------|-----|------|------|------|------|-----|------|------|--|
| Asp | Lys | Ser | Arg | Arg | Val | Leu | Glu | Tyr | Tyr | Leu | Arg | Asp | Asn | Lys | Phe | |
| | | | 580 | | | | | 585 | | | | | 590 | | | |
| Asn | Glu | Cys | Asp | Leu | Tyr | Asn | Cys | Val | Val | Asn | Gln | Ser | Tyr | Leu | Asn | |
| | | 595 | | | | | 600 | | | | 605 | | | | | |
| Asn | Pro | Asn | His | Val | Val | Ser | Leu | Thr | Gly | Lys | Glu | Arg | Glu | Leu | Ser | |
| | 610 | | | | | 615 | | | | | 620 | | | | | |
| Val | Gly | Arg | Met | Phe | Ala | Met | Gln | Pro | Gly | Met | Phe | Arg | Gln | Val | Gln | |
| 625 | | | | | 630 | | | | | | 635 | | | | 640 | |
| Ile | Leu | Ala | Glu | Lys | Met | Ile | Ala | Glu | Asn | Ile | Leu | Gln | Phe | Phe | Pro | |
| | | | | 645 | | | | | 650 | | | | | 655 | | |
| Glu | Ser | Leu | Thr | Arg | Tyr | Gly | Asp | Leu | Glu | Leu | Gln | Lys | Ile | Leu | Glu | |
| | | | 660 | | | | | 665 | | | | | 670 | | | |
| Leu | Lys | Ala | Gly | Ile | Ser | Asn | Lys | Ser | Asn | Arg | Tyr | Asn | Asp | Asn | Tyr | |
| | | 675 | | | | | 680 | | | | | 685 | | | | |
| Asn | Asn | Tyr | Ile | Ser | Lys | Cys | Ser | Ile | Ile | Thr | Asp | Leu | Ser | Lys | Phe | |
| | 690 | | | | | 695 | | | | | 700 | | | | | |
| Asn | Gln | Ala | Phe | Arg | Tyr | Glu | Thr | Ser | Cys | Ile | Cys | Ser | Asp | Val | Leu | |
| 705 | | | | | 710 | | | | | 715 | | | | | 720 | |
| Asp | Glu | Leu | His | Gly | Val | Gln | Ser | Leu | Phe | Ser | Trp | Leu | His | Leu | Thr | |
| | | | 725 | | | | | | | 730 | | | | 735 | | |
| Ile | Pro | His | Val | Thr | Ile | Ile | Cys | Thr | Tyr | Arg | His | Ala | Pro | Pro | Tyr | |
| | | | 740 | | | | | 745 | | | | | 750 | | | |
| Ile | Gly | Asp | His | Ile | Val | Asp | Leu | Asn | Asn | Val | Asp | Glu | Gln | Ser | Gly | |
| | | 755 | | | | | 760 | | | | | 765 | | | | |
| Leu | Tyr | Arg | Tyr | His | Met | Gly | Gly | Ile | Glu | Gly | Trp | Cys | Gln | Lys | Leu | |
| | 770 | | | | | 775 | | | | | 780 | | | | | |
| Trp | Thr | Ile | Glu | Ala | Ile | Ser | Leu | Leu | Asp | Leu | Ile | Ser | Leu | Lys | Gly | |
| 785 | | | | | 790 | | | | | 795 | | | | | 800 | |
| Lys | Phe | Ser | Ile | Thr | Ala | Leu | Ile | Asn | Gly | Asp | Asn | Gln | Ser | Ile | Asp | |
| | | | | 805 | | | | | 810 | | | | | 815 | | |
| Ile | Ser | Lys | Pro | Ile | Arg | Leu | Met | Glu | Gly | Gln | Thr | His | Ala | Gln | Ala | |
| | | | 820 | | | | | 825 | | | | | 830 | | | |
| Asp | Tyr | Leu | Leu | Ala | Leu | Asn | Ser | Leu | Lys | Leu | Leu | Tyr | Lys | Glu | Tyr | |
| | | 835 | | | | | 840 | | | | | 845 | | | | |
| Ala | Gly | Ile | Gly | His | Lys | Leu | Lys | Gly | Thr | Glu | Thr | Tyr | Ile | Ser | Arg | |
| | 850 | | | | | 855 | | | | | 860 | | | | | |
| Asp | Met | Gln | Phe | Met | Ser | Lys | Thr | Ile | Gln | His | Asn | Gly | Val | Tyr | Tyr | |
| 865 | | | | | 870 | | | | | 875 | | | | | 880 | |
| Pro | Ala | Ser | Ile | Lys | Lys | Val | Leu | Arg | Val | Gly | Pro | Trp | Ile | Asn | Thr | |
| | | | | 885 | | | | | 890 | | | | | 895 | | |
| Ile | Leu | Asp | Asp | Phe | Lys | Val | Ser | Leu | Glu | Ser | Ile | Gly | Ser | Leu | Thr | |
| | | 900 | | | | | | 905 | | | | | 910 | | | |
| Gln | Glu | Leu | Glu | Tyr | Arg | Gly | Glu | Ser | Leu | Leu | Cys | Ser | Leu | Ile | Phe | |
| | 915 | | | | | | 920 | | | | | 925 | | | | |
| Arg | Asn | Val | Trp | Leu | Tyr | Asn | Gln | Ile | Ala | Leu | Gln | Leu | Lys | Asn | His | |
| | 930 | | | | | 935 | | | | | 940 | | | | | |
| Ala | Leu | Cys | Asn | Asn | Lys | Leu | Tyr | Leu | Asp | Ile | Leu | Lys | Val | Leu | Lys | |
| 945 | | | | | 950 | | | | | 955 | | | | | 960 | |
| His | Leu | Lys | Thr | Phe | Phe | Asn | Leu | Asp | Asn | Ile | Asp | Thr | Ala | Leu | Thr | |
| | | | | 965 | | | | | 970 | | | | | 975 | | |
| Leu | Tyr | Met | Asn | Leu | Pro | Met | Leu | Phe | Gly | Gly | Gly | Asp | Pro | Asn | Leu | |
| | | 980 | | | | | | 985 | | | | | 990 | | | |
| Leu | Tyr | Arg | Ser | Phe | Tyr | Arg | Arg | Thr | Pro | Asp | Phe | Leu | Thr | Glu | Ala | |
| | | 995 | | | | | 1000 | | | | | 1005 | | | | |
| Ile | Val | His | Ser | Val | Phe | Ile | Leu | Ser | Tyr | Tyr | Thr | Asn | His | Asp | Leu | |
| | 1010 | | | | | 1015 | | | | | 1020 | | | | | |
| Lys | Asp | Lys | Leu | Gln | Asp | Leu | Ser | Asp | Asp | Arg | Leu | Asn | Lys | Phe | Leu | |
| 1025 | | | | | 1030 | | | | | 1035 | | | | | 1040 | |
| Thr | Cys | Ile | Ile | Thr | Phe | Asp | Lys | Asn | Pro | Asn | Ala | Glu | Phe | Val | Thr | |
| | | | | 1045 | | | | | 1050 | | | | | 1055 | | |
| Leu | Met | Arg | Asp | Pro | Gln | Ala | Leu | Gly | Ser | Glu | Arg | Gln | Ala | Lys | Ile | |

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Lys Leu Glu Cys Asp Met Asn Thr Ser Asp Leu Leu Cys Val Leu Glu
 1555 1560 1565
 Leu Ile Asp Ser Ser Tyr Trp Lys Ser Met Ser Lys Val Phe Leu Glu
 1570 1575 1580
 Gln Lys Val Ile Lys Tyr Ile Leu Ser Gln Asp Ala Ser Leu His Arg
 1585 1590 1595 1600
 Val Lys Gly Cys His Ser Phe Lys Leu Trp Phe Leu Lys Arg Leu Asn
 1605 1610 1615
 Val Ala Glu Phe Thr Val Cys Pro Trp Val Val Asn Ile Asp Tyr His
 1620 1625 1630
 Pro Thr His Met Lys Ala Ile Leu Thr Tyr Ile Asp Leu Val Arg Met
 1635 1640 1645
 Gly Leu Ile Asn Ile Asp Arg Ile His Ile Lys Asn Lys His Lys Phe
 1650 1655 1660
 Asn Asp Glu Phe Tyr Thr Ser Asn Leu Phe Tyr Ile Asn Tyr Asn Phe
 1665 1670 1675 1680
 Ser Asp Asn Thr His Leu Leu Thr Lys His Ile Arg Ile Ala Asn Ser
 1685 1690 1695
 Glu Leu Glu Asn Asn Tyr Asn Lys Leu Tyr His Pro Thr Pro Glu Thr
 1700 1705 1710
 Leu Glu Asn Ile Leu Ala Asn Pro Ile Lys Ser Asn Asp Lys Lys Thr
 1715 1720 1725
 Leu Asn Asp Tyr Cys Ile Gly Lys Asn Val Asp Ser Ile Met Leu Pro
 1730 1735 1740
 Leu Leu Ser Asn Lys Lys Leu Ile Lys Ser Ser Ala Met Ile Arg Thr
 1745 1750 1755 1760
 Asn Tyr Ser Lys Gln Asp Leu Tyr Asn Leu Phe Pro Met Val Val Ile
 1765 1770 1775
 Asp Arg Ile Ile Asp His Ser Gly Asn Thr Ala Lys Ser Asn Gln Leu
 1780 1785 1790
 Tyr Thr Thr Thr Ser His Gln Ile Ser Leu Val His Asn Ser Thr Ser
 1795 1800 1805
 Leu Tyr Cys Met Leu Pro Trp His His Ile Asn Arg Phe Asn Phe Val
 1810 1815 1820
 Phe Ser Ser Thr Gly Cys Lys Ile Ser Ile Glu Tyr Ile Leu Lys Asp
 1825 1830 1835 1840
 Leu Lys Ile Lys Asp Pro Asn Cys Ile Ala Phe Ile Gly Glu Gly Ala
 1845 1850 1855
 Gly Asn Leu Leu Leu Arg Thr Val Val Glu Leu His Pro Asp Ile Arg
 1860 1865 1870
 Tyr Ile Tyr Arg Ser Leu Lys Asp Cys Asn Asp His Ser Leu Pro Ile
 1875 1880 1885
 Glu Phe Leu Arg Leu Tyr Asn Gly His Ile Asn Ile Asp Tyr Gly Glu
 1890 1895 1900
 Asn Leu Thr Ile Pro Ala Thr Asp Ala Thr Asn Asn Ile His Trp Ser
 1905 1910 1915 1920
 Tyr Leu His Ile Lys Phe Ala Glu Pro Ile Ser Leu Phe Val Cys Asp
 1925 1930 1935
 Ala Glu Leu Ser Val Thr Val Asn Trp Ser Lys Ile Ile Ile Glu Trp
 1940 1945 1950
 Ser Lys His Val Arg Lys Cys Lys Tyr Cys Ser Ser Val Asn Lys Cys
 1955 1960 1965
 Met Leu Ile Val Lys Tyr His Ala Gln Asp Asp Ile Asp Phe Lys Leu
 1970 1975 1980
 Asp Asn Ile Thr Ile Leu Lys Thr Tyr Val Cys Leu Gly Ser Lys Leu
 1985 1990 1995 2000
 Lys Gly Ser Glu Val Tyr Leu Val Leu Thr Ile Gly Pro Ala Asn Ile
 2005 2010 2015
 Phe Pro Val Phe Asn Val Val Gln Asn Ala Lys Leu Ile Leu Ser Arg
 2020 2025 2030
 Thr Lys Asn Phe Ile Met Pro Lys Lys Ala Asp Lys Glu Ser Ile Asp

| | | |
|---|------|------|
| 2035 | 2040 | 2045 |
| Ala Asn Ile Lys Ser Leu Ile Pro Phe Leu Cys Tyr Pro Ile Thr Lys | | |
| 2050 | 2055 | 2060 |
| Lys Gly Ile Asn Thr Ala Leu Ser Lys Leu Lys Ser Val Val Ser Gly | | |
| 2065 | 2070 | 2075 |
| Asp Ile Leu Ser Tyr Ser Ile Ala Gly Arg Asn Glu Val Phe Ser Asn | | 2080 |
| 2085 | 2090 | 2095 |
| Lys Leu Ile Asn His Lys His Met Asn Ile Leu Lys Trp Phe Asn His | | |
| 2100 | 2105 | 2110 |
| Val Leu Asn Phe Arg Ser Thr Glu Leu Asn Tyr Asn His Leu Tyr Met | | |
| 2115 | 2120 | 2125 |
| Val Glu Ser Thr Tyr Pro Tyr Leu Ser Glu Leu Leu Asn Ser Leu Thr | | |
| 2130 | 2135 | 2140 |
| Thr Asn Glu Leu Lys Lys Leu Ile Lys Ile Thr Gly Ser Leu Leu Tyr | | |
| 2145 | 2150 | 2155 |
| Asn Phe His Asn Glu | | 2160 |
| 2165 | | |

<210> 394

<211> 241

<212> PRT

<213> Human respiratory syncytial virus

<220>

<223> phosphoprotein P of Human respiratory syncytial virus

<400> 394

| | | |
|---|-----|-----|
| Met Glu Lys Phe Ala Pro Glu Phe His Gly Glu Asp Ala Asn Asn Arg | | |
| 1 | 5 | 10 |
| Ala Thr Lys Phe Leu Glu Ser Ile Lys Gly Lys Phe Thr Ser Pro Lys | | 15 |
| 20 | 25 | 30 |
| Asp Pro Lys Lys Lys Asp Ser Ile Ile Ser Val Asn Ser Ile Asp Ile | | |
| 35 | 40 | 45 |
| Glu Val Thr Lys Glu Ser Pro Ile Thr Ser Asn Ser Thr Ile Met Asn | | |
| 50 | 55 | 60 |
| Pro Thr Asn Glu Thr Asp Asp Thr Val Gly Asn Lys Pro Asn Tyr Gln | | |
| 65 | 70 | 75 |
| Arg Lys Pro Leu Val Ser Phe Lys Glu Asp Pro Met Leu Ser Asp Asn | | 80 |
| 85 | 90 | 95 |
| Pro Phe Ser Lys Leu Tyr Lys Glu Thr Ile Glu Thr Phe Asp Asn Asn | | |
| 100 | 105 | 110 |
| Glu Glu Glu Ser Ser Tyr Ser Tyr Glu Glu Ile Asn Asp Gln Thr Asn | | |
| 115 | 120 | 125 |
| Asp Asn Ile Thr Ala Arg Leu Asp Arg Ile Asp Glu Lys Leu Ser Glu | | |
| 130 | 135 | 140 |
| Ile Leu Gly Met Leu His Thr Leu Val Val Ala Ser Ala Gly Pro Thr | | |
| 145 | 150 | 155 |
| Ser Ala Arg Asp Gly Ile Arg Asp Ala Met Val Gly Leu Arg Glu Glu | | |
| 165 | 170 | 175 |
| Met Ile Glu Lys Ile Arg Thr Glu Ala Leu Met Thr Asn Asn Arg Leu | | |
| 180 | 185 | 190 |
| Glu Ala Met Ala Arg Leu Arg Asn Glu Glu Ser Glu Lys Met Ala Lys | | |
| 195 | 200 | 205 |
| Asp Thr Ser Asp Glu Val Ser Leu Asn Pro Thr Ser Glu Lys Leu Asn | | |
| 210 | 215 | 220 |
| Asn Leu Leu Glu Gly Asn Asp Ser Asp Asp Asp Leu Ser Leu Glu Asp | | |
| 225 | 230 | 235 |
| Phe | | 240 |

<210> 395

<211> 83
 <212> PRT
 <213> Human respiratory syncytial virus

<220>
 <223> attachment glycoprotein G of Human respiratory syncytial virus

<400> 395
 Lys Arg Asp Pro Lys Thr Pro Ala Lys Met Leu Asn Lys Glu Thr Thr
 1 5 10 15
 Thr Asn Pro Thr Lys Asn Leu Thr Leu Lys Thr Thr Glu Arg Asp Thr
 20 25 30
 Ser Thr Ser Gln Ser Thr Val Leu Asp Thr Ser Thr Ser Lys His Ile
 35 40 45
 Ile Leu Gln Gln Ser Leu His Ser Thr Thr Pro Glu Asn Thr Pro Asn
 50 55 60
 Phe Thr Gln Thr Pro Thr Ala Ser Glu Pro Ser Thr Ser Asn Ser Thr
 65 70 75 80
 Gln Lys Thr

<210> 396
 <211> 391
 <212> PRT
 <213> human respiratory syncytial virus (strain 18537)

<220>
 <223> nucleocapsid protein of Human respiratory syncytial virus

<400> 396
 Met Ala Leu Ser Lys Val Lys Leu Asn Asp Thr Leu Asn Lys Asp Gln
 1 5 10 15
 Leu Leu Ser Ser Ser Lys Tyr Thr Ile Gln Arg Ser Thr Gly Asp Asn
 20 25 30
 Ile Asp Thr Pro Asn Tyr Asp Val Gln Lys His Leu Asn Lys Leu Cys
 35 40 45
 Gly Met Leu Leu Ile Thr Glu Asp Ala Asn His Lys Phe Thr Gly Leu
 50 55 60
 Ile Gly Met Leu Tyr Ala Met Ser Arg Leu Gly Arg Glu Asp Thr Ile
 65 70 75 80
 Lys Ile Leu Lys Asp Ala Gly Tyr His Val Lys Ala Asn Gly Val Asp
 85 90 95
 Ile Thr Thr Tyr Arg Gln Asp Ile Asn Gly Lys Glu Met Lys Phe Glu
 100 105 110
 Val Leu Thr Leu Ser Ser Leu Thr Ser Glu Ile Gln Val Asn Ile Glu
 115 120 125
 Ile Glu Ser Arg Lys Ser Tyr Lys Lys Leu Leu Lys Glu Met Gly Glu
 130 135 140
 Val Ala Pro Glu Tyr Arg His Asp Ser Pro Asp Cys Gly Met Ile Ile
 145 150 155 160
 Leu Cys Ile Ala Ala Leu Val Ile Thr Lys Leu Ala Ala Gly Asp Arg
 165 170 175
 Ser Gly Leu Thr Ala Val Ile Arg Arg Ala Asn Asn Val Leu Lys Asn
 180 185 190
 Glu Ile Lys Arg Tyr Lys Gly Leu Ile Pro Lys Asp Ile Ala Asn Ser
 195 200 205
 Phe Tyr Glu Val Phe Glu Lys His Pro His Leu Ile Asp Val Phe Val
 210 215 220
 His Phe Gly Ile Ala Gln Ser Ser Thr Arg Gly Gly Ser Arg Val Glu
 225 230 235 240

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Ile | Phe | Ala | Gly | Leu | Phe | Met | Asn | Ala | Tyr | Gly | Ser | Gly | Gln | Val |
| | | | | 245 | | | | | 250 | | | | | 255 | |
| Met | Leu | Arg | Trp | Gly | Val | Leu | Ala | Lys | Ser | Val | Lys | Asn | Ile | Met | Leu |
| | | | 260 | | | | | 265 | | | | 270 | | | |
| Gly | His | Ala | Ser | Val | Gln | Ala | Glu | Met | Glu | Gln | Val | Val | Glu | Val | Tyr |
| | 275 | | | | | | 280 | | | | | 285 | | | |
| Glu | Tyr | Ala | Gln | Lys | Leu | Gly | Gly | Glu | Ala | Gly | Phe | Tyr | His | Ile | Leu |
| | 290 | | | | | 295 | | | | | 300 | | | | |
| Asn | Asn | Pro | Lys | Ala | Ser | Leu | Leu | Ser | Leu | Thr | Gln | Phe | Pro | Asn | Phe |
| 305 | | | | | 310 | | | | | 315 | | | | | 320 |
| Ser | Ser | Val | Val | Leu | Gly | Asn | Ala | Ala | Gly | Leu | Gly | Ile | Met | Gly | Glu |
| | | | | 325 | | | | | 330 | | | | | 335 | |
| Tyr | Arg | Gly | Thr | Pro | Arg | Asn | Gln | Asp | Leu | Tyr | Asp | Ala | Ala | Lys | Ala |
| | | | 340 | | | | | 345 | | | | | 350 | | |
| Tyr | Ala | Glu | Gln | Leu | Lys | Glu | Asn | Gly | Val | Ile | Asn | Tyr | Ser | Val | Leu |
| | 355 | | | | | | 360 | | | | | 365 | | | |
| Asp | Leu | Thr | Ala | Glu | Glu | Leu | Glu | Ala | Ile | Lys | His | Gln | Leu | Asn | Pro |
| | 370 | | | | | 375 | | | | | 380 | | | | |
| Lys | Glu | Asp | Asp | Val | Glu | Leu | | | | | | | | | |
| 385 | | | | | 390 | | | | | | | | | | |

<210> 397

<211> 391

<212> PRT

<213> Human respiratory syncytial virus

<220>

<223> nucleoprotein (N) of Human respiratory syncytial virus

<400> 397

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ala | Leu | Ser | Lys | Val | Lys | Leu | Asn | Asp | Thr | Leu | Asn | Lys | Asp | Gln |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Leu | Leu | Ser | Ser | Ser | Lys | Tyr | Thr | Ile | Gln | Arg | Ser | Thr | Gly | Asp | Ser |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Ile | Asp | Thr | Pro | Asn | Tyr | Asp | Val | Gln | Lys | His | Ile | Asn | Lys | Leu | Cys |
| | 35 | | | | | 40 | | | | | | 45 | | | |
| Gly | Met | Leu | Leu | Ile | Thr | Glu | Asp | Ala | Asn | His | Lys | Phe | Thr | Gly | Leu |
| | 50 | | | | 55 | | | | | | 60 | | | | |
| Ile | Gly | Met | Leu | Tyr | Ala | Met | Ser | Arg | Leu | Gly | Arg | Glu | Asp | Thr | Ile |
| 65 | | | | 70 | | | | | 75 | | | | | | 80 |
| Lys | Ile | Leu | Arg | Asp | Ala | Gly | Tyr | His | Val | Lys | Ala | Asn | Gly | Val | Asp |
| | | | 85 | | | | | 90 | | | | | 95 | | |
| Val | Thr | Thr | His | Arg | Gln | Asp | Ile | Asn | Gly | Lys | Glu | Met | Lys | Phe | Glu |
| | | | 100 | | | | 105 | | | | | | 110 | | |
| Val | Leu | Thr | Leu | Ser | Ser | Leu | Thr | Glu | Ile | Gln | Ile | Asn | Ile | Glu | |
| | 115 | | | | | | 120 | | | | | 125 | | | |
| Ile | Glu | Ser | Arg | Lys | Ser | Tyr | Lys | Lys | Met | Leu | Lys | Glu | Met | Gly | Glu |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Val | Ala | Pro | Glu | Tyr | Arg | His | Asp | Ser | Pro | Asp | Cys | Gly | Met | Ile | Ile |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Leu | Cys | Ile | Ala | Ala | Leu | Val | Ile | Thr | Lys | Leu | Ala | Ala | Gly | Asp | Arg |
| | | | 165 | | | | | 170 | | | | | | 175 | |
| Ser | Gly | Leu | Thr | Ala | Val | Ile | Arg | Arg | Ala | Asn | Asn | Val | Leu | Lys | Asn |
| | | | 180 | | | | 185 | | | | | | 190 | | |
| Glu | Met | Lys | Arg | Tyr | Lys | Gly | Leu | Pro | Lys | Asp | Ile | Ala | Asn | Ser | |
| | 195 | | | | | 200 | | | | | 205 | | | | |
| Phe | Tyr | Glu | Val | Phe | Glu | Lys | Tyr | Pro | His | Phe | Ile | Asp | Val | Phe | Val |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| His | Phe | Gly | Ile | Ala | Gln | Ser | Ser | Thr | Arg | Gly | Gly | Ser | Arg | Val | Glu |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 |

Gly Ile Phe Ala Gly Leu Phe Met Asn Ala Tyr Gly Ala Gly Gln Val
 245 250 255
 Met Leu Arg Trp Gly Val Leu Ala Lys Ser Val Lys Asn Ile Met Leu
 260 265 270
 Gly His Ala Ser Val Gln Ala Glu Met Glu Gln Val Val Glu Val Tyr
 275 280 285
 Glu Tyr Ala Gln Lys Leu Gly Gly Glu Ala Gly Phe Tyr His Ile Leu
 290 295 300
 Asn Asn Pro Lys Ala Ser Leu Leu Ser Leu Thr Gln Phe Pro His Phe
 305 310 315 320
 Ser Ser Val Val Leu Gly Asn Ala Ala Gly Leu Gly Ile Met Gly Glu
 325 330 335
 Tyr Arg Gly Thr Pro Arg Asn Gln Asp Leu Tyr Asp Ala Ala Lys Ala
 340 345 350
 Tyr Ala Glu Gln Leu Lys Glu Asn Gly Val Ile Asn Tyr Ser Val Leu
 355 360 365
 Asp Leu Thr Ala Glu Glu Leu Glu Ala Ile Lys His Gln Leu Asn Pro
 370 375 380
 Lys Asp Asn Asp Val Glu Leu
 385 390

<210> 398

<211> 256

<212> PRT

<213> Human respiratory syncytial virus

<220>

<223>matrix protein of Human respiratory syncytial virus

<400> 398

Met Glu Thr Tyr Val Asn Lys Leu His Glu Gly Ser Thr Tyr Thr Ala
 1 5 10 15
 Ala Val Gln Tyr Asn Val Leu Glu Lys Asp Asp Asp Pro Ala Ser Leu
 20 25 30
 Thr Ile Trp Val Pro Met Phe Gln Ser Ser Met Pro Ala Asp Leu Leu
 35 40 45
 Ile Lys Glu Leu Ala Asn Val Asn Ile Leu Val Lys Gln Ile Ser Thr
 50 55 60
 Pro Lys Gly Pro Ser Leu Arg Val Met Ile Asn Ser Arg Ser Ala Val
 65 70 75 80
 Leu Ala Gln Met Pro Ser Lys Phe Thr Ile Cys Ala Asn Val Ser Leu
 85 90 95
 Asp Glu Arg Ser Lys Leu Ala Tyr Asp Val Thr Thr Pro Cys Glu Ile
 100 105 110
 Lys Ala Cys Ser Leu Thr Cys Leu Lys Ser Lys Asn Met Leu Thr Thr
 115 120 125
 Val Lys Asp Leu Thr Met Lys Thr Leu Asn Pro Thr His Asp Ile Ile
 130 135 140
 Ala Leu Cys Glu Phe Glu Asn Ile Val Thr Ser Lys Lys Val Ile Ile
 145 150 155 160
 Pro Thr Tyr Leu Arg Ser Ile Ser Val Arg Asn Lys Asp Leu Asn Thr
 165 170 175
 Leu Glu Asn Ile Thr Thr Thr Glu Phe Lys Asn Ala Ile Thr Asn Ala
 180 185 190
 Lys Ile Ile Pro Tyr Ser Gly Leu Leu Val Ile Thr Val Thr Asp
 195 200 205
 Asn Lys Gly Ala Phe Lys Tyr Ile Lys Pro Gln Ser Gln Phe Ile Val
 210 215 220
 Asp Leu Gly Ala Tyr Leu Glu Lys Glu Ser Ile Tyr Tyr Val Thr Thr
 225 230 235 240

Asn Trp Lys His Thr Ala Thr Arg Phe Ala Ile Lys Pro Met Glu Asp
245 250 255

<210> 399
<211> 1185
<212> DNA
<213> Human metapneumovirus

<220>
<221> CDS
<222> (1)...(1185)
<223> Nucleoprotein (N)

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<400> 399
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Met Ser Leu Gln Gly Ile His Leu Ser Asp Leu Ser Tyr Lys His Ala
1 5 10 15
ata tta aaa gag tct cag tac aca ata aaa aga gat gtg ggt aca aca 96
Ile Leu Lys Glu Ser Gln Tyr Thr Ile Lys Arg Asp Val Gly Thr Thr
20 25 30
act gca gtg aca ccc tca tca ttg caa caa gaa ata aca ctg ttg tgt 144
Thr Ala Val Thr Pro Ser Ser Leu Gln Gln Glu Ile Thr Leu Leu Cys
35 40 45
gga gaa att ctg tat gct aaa cat gct gac tac aaa tat gct gca gaa 192
Gly Glu Ile Leu Tyr Ala Lys His Ala Asp Tyr Lys Tyr Ala Ala Glu
50 55 60
ata gga ata caa tat att agc aca gct tta gga tca gag aga gtg cag 240
Ile Gly Ile Gln Tyr Ile Ser Thr Ala Leu Gly Ser Glu Arg Val Gln
65 70 75 80
cag att ctg agg aac tca ggc agt gaa gtc caa gtg gtc tta acc aga 288
Gln Ile Leu Arg Asn Ser Gly Ser Glu Val Gln Val Val Leu Thr Arg
85 90 95
acg tac tct ctg ggg aaa att aaa aac aat aaa gga gaa gat tta cag 336
Thr Tyr Ser Leu Gly Lys Ile Lys Asn Asn Lys Gly Glu Asp Leu Gln
100 105 110
atg tta gac ata cac ggg gta gag aag agc tgg gta gaa gag ata gac 384
Met Leu Asp Ile His Gly Val Glu Lys Ser Trp Val Glu Glu Ile Asp
115 120 125
aaa gaa gca agg aaa aca atg gca acc ttg ctt aag gaa tca tca ggt 432
Lys Glu Ala Arg Lys Thr Met Ala Thr Leu Leu Lys Glu Ser Ser Gly
130 135 140
aat atc cca caa aat cag agg ccc tca gca cca gac aca ccc ata atc 480
Asn Ile Pro Gln Asn Gln Arg Pro Ser Ala Pro Asp Thr Pro Ile Ile
145 150 155 160
tta tta tgt gta ggt gcc tta ata ttc act aaa cta gca tca acc ata 528
Leu Leu Cys Val Gly Ala Leu Ile Phe Thr Lys Leu Ala Ser Thr Ile
165 170 175
gaa gtg gga cta gag acc aca gtc aga agg gct aac cgt gta cta agt 576
Glu Val Gly Leu Glu Thr Thr Val Arg Arg Ala Asn Arg Val Leu Ser
180 185 190
gat gca ctc aag aga tac cct aga atg gac ata cca aag att gcc aga 624
Asp Ala Leu Lys Arg Tyr Pro Arg Met Asp Ile Pro Lys Ile Ala Arg
195 200 205
tcc ttc tat gac tta ttt gaa caa aaa gtg tat cac aga agt ttg ttc 672
Ser Phe Tyr Asp Leu Phe Glu Gln Lys Val Tyr His Arg Ser Leu Phe
210 215 220
att gag tat ggc aaa gca tta ggc tca tca tct aca ggc agc aaa gca 720
Ile Glu Tyr Gly Lys Ala Leu Gly Ser Ser Ser Thr Gly Ser Lys Ala
225 230 235 240
gaa agt cta ttt gtt aat ata ttc atg caa gct tat ggg gcc ggt caa 768

```

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| Glu | Ser | Leu | Phe | Val | Asn | Ile | Phe | Met | Gln | Ala | Tyr | Gly | Ala | Gly | Gln | |
| | | | | 245 | | | | | 250 | | | | | 255 | | |
| aca | atg | cta | agg | tgg | ggg | gtc | att | gcc | agg | tca | tcc | aac | aat | ata | atg | 816 |
| Thr | Met | Leu | Arg | Trp | Gly | Val | Ile | Ala | Arg | Ser | Ser | Asn | Asn | Ile | Met | |
| | | | 260 | | | | | 265 | | | | | 270 | | | |
| tta | gga | cat | gta | tcc | gtc | caa | gct | gag | tta | aaa | cag | gtc | aca | gaa | gtc | 864 |
| Leu | Gly | His | Val | Ser | Val | Gln | Ala | Glu | Leu | Lys | Gln | Val | Thr | Glu | Val | |
| | | 275 | | | | | 280 | | | | | 285 | | | | |
| tat | gac | ttg | gtg | cga | gaa | atg | ggc | cct | gaa | tct | gga | ctt | cta | cat | tta | 912 |
| Tyr | Asp | Leu | Val | Arg | Glu | Met | Gly | Pro | Glu | Ser | Gly | Leu | Leu | His | Leu | |
| | 290 | | | | | 295 | | | | | 300 | | | | | |
| agg | caa | agc | cca | aaa | gct | gga | ctg | tta | tca | cta | gcc | aac | tgt | ccc | aac | 960 |
| Arg | Gln | Ser | Pro | Lys | Ala | Gly | Leu | Leu | Ser | Leu | Ala | Asn | Cys | Pro | Asn | |
| 305 | | | | 310 | | | | | 315 | | | | | 320 | | |
| ttt | gca | agt | gtt | gtt | ctc | gga | aat | gcc | tca | ggc | tta | ggc | ata | atc | ggg | 1008 |
| Phe | Ala | Ser | Val | Val | Leu | Gly | Asn | Ala | Ser | Gly | Leu | Gly | Ile | Ile | Gly | |
| | | | 325 | | | | | 330 | | | | | 335 | | | |
| atg | tat | cga | ggg | aga | gta | cca | aac | aca | gaa | tta | ttt | tca | gca | gct | gaa | 1056 |
| Met | Tyr | Arg | Gly | Arg | Val | Pro | Asn | Thr | Glu | Leu | Phe | Ser | Ala | Ala | Glu | |
| | | 340 | | | | | | 345 | | | | | 350 | | | |
| agt | tat | gcc | aaa | agt | ttg | aaa | gaa | agc | aat | aaa | ata | aat | ttc | tct | tca | 1104 |
| Ser | Tyr | Ala | Lys | Ser | Leu | Lys | Glu | Ser | Asn | Lys | Ile | Asn | Phe | Ser | Ser | |
| | | 355 | | | | | 360 | | | | | 365 | | | | |
| tta | gga | ctt | aca | gat | gaa | gag | aaa | gag | gct | gca | gaa | cat | ttc | tta | aat | 1152 |
| Leu | Gly | Leu | Thr | Asp | Glu | Glu | Lys | Glu | Ala | Ala | Glu | His | Phe | Leu | Asn | |
| | | 370 | | | | 375 | | | | | 380 | | | | | |
| gtg | agt | gac | gac | agt | caa | aat | gat | tat | gag | taa | | | | | | 1185 |
| Val | Ser | Asp | Asp | Ser | Gln | Asn | Asp | Tyr | Glu | * | | | | | | |
| 385 | | | | 390 | | | | | | | | | | | | |

<210> 400

<211> 885

<212> DNA

<213> Human metapneumovirus

<220>

<221> CDS

<222> (1)...(885)

<223> Phosphoprotein (P)

<400> 400

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| atg | tca | ttc | cct | gaa | gga | aaa | gat | att | ctt | ttc | atg | ggg | aat | gaa | gca | 48 |
| Met | Ser | Phe | Pro | Glu | Gly | Lys | Asp | Ile | Leu | Phe | Met | Gly | Asn | Glu | Ala | |
| 1 | | | 5 | | | | | 10 | | | | | 15 | | | |
| gca | aaa | tta | gca | gaa | gct | ttc | cag | aaa | tca | tta | aga | aaa | cca | ggg | cat | 96 |
| Ala | Lys | Leu | Ala | Glu | Ala | Phe | Gln | Lys | Ser | Leu | Arg | Lys | Pro | Gly | His | |
| | | | 20 | | | | | 25 | | | | | 30 | | | |
| aaa | aga | tct | caa | tct | att | ata | gga | gaa | aaa | gtg | aat | act | gta | tca | gaa | 144 |
| Lys | Arg | Ser | Gln | Ser | Ile | Ile | Gly | Glu | Lys | Val | Asn | Thr | Val | Ser | Glu | |
| | | 35 | | | | | 40 | | | | | 45 | | | | |
| aca | ttg | gaa | tta | cct | act | atc | agt | aga | cct | gca | aaa | cca | acc | ata | ccg | 192 |
| Thr | Leu | Glu | Leu | Pro | Thr | Ile | Ser | Arg | Pro | Ala | Lys | Pro | Thr | Ile | Pro | |
| | 50 | | | | | 55 | | | | 60 | | | | | | |
| tca | gaa | cca | aag | tta | gca | tgg | aca | gat | aaa | ggg | ggg | gca | acc | aaa | act | 240 |
| Ser | Glu | Pro | Lys | Leu | Ala | Trp | Thr | Asp | Lys | Gly | Gly | Ala | Thr | Lys | Thr | |
| | 65 | | | | 70 | | | | 75 | | | | | 80 | | |
| gaa | ata | aag | caa | gca | atc | aaa | gtc | atg | gat | ccc | att | gaa | gaa | gaa | gag | 288 |
| Glu | Ile | Lys | Gln | Ala | Ile | Lys | Val | Met | Asp | Pro | Ile | Glu | Glu | Glu | Glu | |
| | | | 85 | | | | | 90 | | | | | 95 | | | |
| tct | acc | gag | aag | aag | gtg | cta | ccc | tcc | agt | gat | ggg | aaa | acc | cct | gca | 336 |
| Ser | Thr | Glu | Lys | Lys | Val | Leu | Pro | Ser | Ser | Asp | Gly | Lys | Thr | Pro | Ala | |

| | | | | | | |
|---|-----|--|-----|--|-----|-----|
| | 100 | | 105 | | 110 | |
| gaa aag aaa ctg aaa cca tca act aac acc aaa aag aag gtt tca ttt | | | | | | 384 |
| Glu Lys Lys Leu Lys Pro Ser Thr Asn Thr Lys Lys Lys Val Ser Phe | | | | | | |
| | 115 | | 120 | | 125 | |
| aca cca aat gaa cca ggg aaa tat aca aag ttg gaa aaa gat gct cta | | | | | | 432 |
| Thr Pro Asn Glu Pro Gly Lys Tyr Thr Lys Leu Glu Lys Asp Ala Leu | | | | | | |
| | 130 | | 135 | | 140 | |
| gat ttg ctc tca gat aat gaa gaa gaa gat gca gaa tct tca atc tta | | | | | | 480 |
| Asp Leu Leu Ser Asp Asn Glu Glu Glu Asp Ala Glu Ser Ser Ile Leu | | | | | | |
| | 145 | | 150 | | 155 | 160 |
| acc ttt gaa gaa aga gat act tca tca tta agc att gag gcc aga ttg | | | | | | 528 |
| Thr Phe Glu Glu Arg Asp Thr Ser Ser Leu Ser Ile Glu Ala Arg Leu | | | | | | |
| | 165 | | 170 | | 175 | |
| gaa tca ata gag gag aaa tta agc atg ata tta ggg cta tta aga aca | | | | | | 576 |
| Glu Ser Ile Glu Glu Lys Leu Ser Met Ile Leu Gly Leu Leu Arg Thr | | | | | | |
| | 180 | | 185 | | 190 | |
| ctc aac att gct aca gca gga ccc aca gca gca aga gat ggg atc aga | | | | | | 624 |
| Leu Asn Ile Ala Thr Ala Gly Pro Thr Ala Ala Arg Asp Gly Ile Arg | | | | | | |
| | 195 | | 200 | | 205 | |
| gat gca atg att ggc gta aga gag gaa tta ata gca gac ata ata aag | | | | | | 672 |
| Asp Ala Met Ile Gly Val Arg Glu Glu Leu Ile Ala Asp Ile Ile Lys | | | | | | |
| | 210 | | 215 | | 220 | |
| gaa gct aaa ggg aaa gca gca gaa atg atg gaa gag gaa atg agt caa | | | | | | 720 |
| Glu Ala Lys Gly Lys Ala Ala Glu Met Met Glu Glu Glu Met Ser Gln | | | | | | |
| | 225 | | 230 | | 235 | 240 |
| cga tca aaa ata gga aat ggt agt gta aaa tta aca gaa aaa gca aaa | | | | | | 768 |
| Arg Ser Lys Ile Gly Asn Gly Ser Val Lys Leu Thr Glu Lys Ala Lys | | | | | | |
| | 245 | | 250 | | 255 | |
| gag ctc aac aaa att gtt gaa gat gaa agc aca agt gga gaa tcc gaa | | | | | | 816 |
| Glu Leu Asn Lys Ile Val Glu Asp Glu Ser Thr Ser Gly Glu Ser Glu | | | | | | |
| | 260 | | 265 | | 270 | |
| gaa gaa gaa gaa cca aaa gac aca caa gac aat agt caa gaa gat gac | | | | | | 864 |
| Glu Glu Glu Glu Pro Lys Asp Thr Gln Asp Asn Ser Gln Glu Asp Asp | | | | | | |
| | 275 | | 280 | | 285 | |
| att tac cag tta att atg tag | | | | | | 885 |
| Ile Tyr Gln Leu Ile Met * | | | | | | |
| | 290 | | | | | |

<210> 401

<211> 765

<212> DNA

<213> Human metapneumovirus

<220>

<221> CDS

<222> (1)...(765)

<223> Matrix Protein (M)

<400> 401

| | |
|---|-----|
| atg gag tcc tac cta gta gac acc tat caa ggc att cct tac aca gca | 48 |
| Met Glu Ser Tyr Leu Val Asp Thr Tyr Gln Gly Ile Pro Tyr Thr Ala | |
| 1 5 10 15 | |
| gct gtt caa gtt gat cta ata gaa aag gac ctg tta cct gca agc cta | 96 |
| Ala Val Gln Val Asp Leu Ile Glu Lys Asp Leu Leu Pro Ala Ser Leu | |
| 20 25 30 | |
| aca ata tgg ttc cct ttg ttt cag gcc aac aca cca cca gca gtg ctg | 144 |
| Thr Ile Trp Phe Pro Leu Phe Gln Ala Asn Thr Pro Pro Ala Val Leu | |
| 35 40 45 | |
| ctc gat cag cta aaa acc ctg aca ata acc act ctg tat gct gca tca | 192 |
| Leu Asp Gln Leu Lys Thr Leu Thr Ile Thr Thr Leu Tyr Ala Ala Ser | |

| | | | |
|-------------------------|-------------------------|-------------------------|-----|
| 50 | 55 | 60 | |
| caa aat ggt cca ata ctc | aaa gtg aat gca tca gcc | caa ggt gca gca | 240 |
| Gln Asn Gly Pro Ile | Leu Lys Val Asn Ala Ser | Ala Gln Gly Ala Ala | |
| 65 | 70 | 75 | 80 |
| atg tct gta ctt ccc | aaa aaa ttt gaa gtc | aat gcg act gta gca ctc | 288 |
| Met Ser Val Leu Pro | Lys Lys Phe Glu Val | Asn Ala Thr Val Ala Leu | |
| 85 | 90 | 95 | |
| gat gaa tat agc aaa | ctg gaa ttt gac aaa | ctc aca gtc tgt gaa gta | 336 |
| Asp Glu Tyr Ser Lys | Leu Glu Phe Asp Lys | Leu Thr Val Cys Glu Val | |
| 100 | 105 | 110 | |
| aaa aca gtt tac tta | aca acc atg aaa cca | tac ggg atg gta tca aaa | 384 |
| Lys Thr Val Tyr Leu | Thr Thr Met Lys Pro | Tyr Gly Met Val Ser Lys | |
| 115 | 120 | 125 | |
| ttt gtg agc tca gcc | aaa tca gtt ggc aaa | aaa aca cat gat cta atc | 432 |
| Phe Val Ser Ser Ala | Lys Ser Val Gly Lys | Lys Thr His Asp Leu Ile | |
| 130 | 135 | 140 | |
| gca cta tgt gat ttt | atg gat cta gaa aag | aac aca cct gtt aca ata | 480 |
| Ala Leu Cys Asp Phe | Met Asp Leu Glu Lys | Asn Thr Pro Val Thr Ile | |
| 145 | 150 | 155 | 160 |
| cca gca ttc atc aaa | tca gtt tca atc aaa | gag agt gag tca gct act | 528 |
| Pro Ala Phe Ile Lys | Ser Val Ser Ile Lys | Glu Ser Glu Ser Ala Thr | |
| 165 | 170 | 175 | |
| gtt gaa gct gct ata | agc agt gaa gca gac | caa gct cta aca cag gcc | 576 |
| Val Glu Ala Ala Ile | Ser Ser Glu Ala Asp | Gln Ala Leu Thr Gln Ala | |
| 180 | 185 | 190 | |
| aaa att gca cct tat | gcg gga tta att atg | atc atg act atg aac aat | 624 |
| Lys Ile Ala Pro Tyr | Ala Gly Leu Ile Met | Ile Met Thr Met Asn Asn | |
| 195 | 200 | 205 | |
| ccc aaa ggc ata ttc | aaa aag ctt gga gct | ggg act caa gtc ata gta | 672 |
| Pro Lys Gly Ile Phe | Lys Lys Leu Gly Ala | Gly Thr Gln Val Ile Val | |
| 210 | 215 | 220 | |
| gaa cta gga gca tat | gtc cag gct gaa agc | ata agc aaa ata tgc aag | 720 |
| Glu Leu Gly Ala Tyr | Val Gln Ala Glu Ser | Ile Ser Lys Ile Cys Lys | |
| 225 | 230 | 235 | 240 |
| act tgg agc cat caa | ggg aca aga tat gtc | ttg aag tcc aga taa | 765 |
| Thr Trp Ser His Gln | Gly Thr Arg Tyr Val | Leu Lys Ser Arg * | |
| 245 | 250 | | |

<210> 402

<211> 564

<212> DNA

<213> Human metapneumovirus

<220>

<221> CDS

<222> (1)...(564)

<223> Matrix Protein 2-1 (M2)

<400> 402

| | | | | |
|---------------------|---------------------|---------------------|-----|-----|
| atg tct cgc aag gct | ccg tgc aaa tat gaa | gtg cgg ggc aaa tgc | aat | 48 |
| Met Ser Arg Lys Ala | Pro Cys Lys Tyr Glu | Val Arg Gly Lys Cys | Asn | |
| 1 | 5 | 10 | 15 | |
| aga gga agt gag tgc | aag ttt aac cac aat | tac tgg agt tgg cca | gat | 96 |
| Arg Gly Ser Glu Cys | Lys Phe Asn His Asn | Tyr Trp Ser Trp Pro | Asp | |
| 20 | 25 | 30 | | |
| aga tac tta tta ata | aga tca aat tat tta | tta aat caa ctt tta | agg | 144 |
| Arg Tyr Leu Leu Ile | Arg Ser Asn Tyr Leu | Leu Asn Gln Leu Leu | Arg | |
| 35 | 40 | 45 | | |
| aac act gat aga gct | gat ggc tta tca ata | ata tca gga gca ggc | aga | 192 |
| Asn Thr Asp Arg Ala | Asp Gly Leu Ser Ile | Ile Ser Gly Ala Gly | Arg | |
| 50 | 55 | 60 | | |

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gaa gat agg aca caa gat ttt gtc cta ggt tcc acc aat gtg gtt caa 240
Glu Asp Arg Thr Gln Asp Phe Val Leu Gly Ser Thr Asn Val Val Gln
65 70 75 80
ggt tat att gat gat aac caa agc ata aca aaa gct gca gcc tgt tac 288
Gly Tyr Ile Asp Asp Asn Gln Ser Ile Thr Lys Ala Ala Ala Cys Tyr
85 90 95
agt cta cat aat ata atc aaa caa cta caa gaa gtt gaa gtt agg cag 336
Ser Leu His Asn Ile Ile Lys Gln Leu Gln Glu Val Glu Val Arg Gln
100 105 110
gct aga gat aac aaa cta tct gac agc aaa cat gta gca ctt cac aac 384
Ala Arg Asp Asn Lys Leu Ser Asp Ser Lys His Val Ala Leu His Asn
115 120 125
tta gtc cta tct tat atg gag atg agc aaa act cct gca tct tta atc 432
Leu Val Leu Ser Tyr Met Glu Met Ser Lys Thr Pro Ala Ser Leu Ile
130 135 140
aac aat ctc aag aga ctg ccg aga gag aaa ctg aaa aaa tta gca aag 480
Asn Asn Leu Lys Arg Leu Pro Arg Glu Lys Leu Lys Lys Leu Ala Lys
145 150 155 160
ctc ata att gac tta tca gca ggt gct gaa aat gac tct tca tat gcc 528
Leu Ile Ile Asp Leu Ser Ala Gly Ala Glu Asn Asp Ser Ser Tyr Ala
165 170 175
ttg caa gac agt gaa agc act aat caa gtg cag tga 564
Leu Gln Asp Ser Glu Ser Thr Asn Gln Val Gln *
180 185

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<210> 403

<211> 216

<212> DNA

<213> Human metapneumovirus

<220>

<221> CDS

<222> (1)...(216)

<223> Matrix Protein 2-2 (M2)

<400> 403

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Met Thr Leu His Met Pro Cys Lys Thr Val Lys Ala Leu Ile Lys Cys
1 5 10 15
agt gag cat ggt cca gtt ttc att act ata gag gtt gat gac atg ata 96
Ser Glu His Gly Pro Val Phe Ile Thr Ile Glu Val Asp Asp Met Ile
20 25 30
tgg act cac aag gac tta aaa gaa gct tta tct gat ggg ata gtg aag 144
Trp Thr His Lys Asp Leu Lys Glu Ala Leu Ser Asp Gly Ile Val Lys
35 40 45
tct cat act aac att tac aat tgt tat tta gaa aac ata gaa att ata 192
Ser His Thr Asn Ile Tyr Asn Cys Tyr Leu Glu Asn Ile Glu Ile Ile
50 55 60
tat gtc aag gct tac tta agt tag 216
Tyr Val Lys Ala Tyr Leu Ser *
65 70

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<210> 404

<211> 552

<212> DNA

<213> Human metapneumovirus

<220>

<221> CDS

<222> (1)...(552)

<223> Small Hydrophobic Protein (SH)

<400> 404

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Met Ile Thr Leu Asp Val Ile Lys Ser Asp Gly Ser Ser Lys Thr Cys
 1           5           10           15
act cac ctc aaa aaa ata att aaa gac cac tct ggt aaa gtg ctt att 96
Thr His Leu Lys Lys Ile Ile Lys Asp His Ser Gly Lys Val Leu Ile
      20           25           30
gta ctt aag tta ata tta gct tta cta aca ttt ctc aca gta aca atc 144
Val Leu Lys Leu Ile Leu Ala Leu Leu Thr Phe Leu Thr Val Thr Ile
      35           40           45
acc atc aat tat ata aaa gtg gaa aac aat ctg caa ata tgc cag tca 192
Thr Ile Asn Tyr Ile Lys Val Glu Asn Asn Leu Gln Ile Cys Gln Ser
      50           55           60
aaa act gaa tca gac aaa aag gac tca tca tca aat acc aca tca gtc 240
Lys Thr Glu Ser Asp Lys Lys Asp Ser Ser Ser Asn Thr Thr Ser Val
      65           70           75           80
aca acc aag act act cta aat cat gat atc aca cag tat ttt aaa agt 288
Thr Thr Lys Thr Thr Leu Asn His Asp Ile Thr Gln Tyr Phe Lys Ser
      85           90           95
ttg att caa agg tat aca aac tct gca ata aac agt gac aca tgc tgg 336
Leu Ile Gln Arg Tyr Thr Asn Ser Ala Ile Asn Ser Asp Thr Cys Trp
      100           105           110
aaa ata aac aga aat caa tgc aca aat ata aca aca tac aaa ttt tta 384
Lys Ile Asn Arg Asn Gln Cys Thr Asn Ile Thr Thr Tyr Lys Phe Leu
      115           120           125
tgt ttt aaa tct gaa gac aca aaa acc aac aat tgt gat aaa ctg aca 432
Cys Phe Lys Ser Glu Asp Thr Lys Thr Asn Asn Cys Asp Lys Leu Thr
      130           135           140
gat tta tgc aga aac aaa cca aaa cca gca gtt gga gtg tat cac ata 480
Asp Leu Cys Arg Asn Lys Pro Lys Pro Ala Val Gly Val Tyr His Ile
      145           150           155           160
gta gaa tgc cat tgt ata tac aca gtt aaa tgg aag tgc tat cat tac 528
Val Glu Cys His Cys Ile Tyr Thr Val Lys Trp Lys Cys Tyr His Tyr
      165           170           175
cca acc gat gaa acc caa tcc taa 552
Pro Thr Asp Glu Thr Gln Ser *
      180

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<210> 405

<211> 2005

<212> PRT

<213> Human metapneumovirus

<220>

<223> RNA-dependent RNA polymerase (L) of Human metapneumovirus

<400> 405

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 1           5           10           15
Tyr Leu Lys Gly Val Ile Ser Phe Ser Glu Thr Asn Ala Ile Gly Ser
      20           25           30
Cys Leu Leu Lys Arg Pro Tyr Leu Lys Asn Asp Asn Thr Ala Lys Val
      35           40           45
Ala Ile Glu Asn Pro Val Ile Glu His Val Arg Leu Lys Asn Ala Val
      50           55           60
Asn Ser Lys Met Lys Ile Ser Asp Tyr Lys Ile Val Glu Pro Val Asn
      65           70           75           80
Met Gln His Glu Ile Met Lys Asn Val His Ser Cys Glu Leu Thr Leu

```

| | | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|--|--|
| | | | | 85 | | | | | 90 | | | | | 95 | | | | | |
| Leu | Lys | Gln | Phe | Leu | Thr | Arg | Ser | Lys | Asn | Ile | Ser | Thr | Leu | Lys | Leu | | | | |
| | | | 100 | | | | | | 105 | | | | | 110 | | | | | |
| Asn | Met | Ile | Cys | Asp | Trp | Leu | Gln | Leu | Lys | Ser | Thr | Ser | Asp | Asp | Thr | | | | |
| | | 115 | | | | | | 120 | | | | | 125 | | | | | | |
| Ser | Ile | Leu | Ser | Phe | Ile | Asp | Val | Glu | Phe | Ile | Pro | Ser | Trp | Val | Ser | | | | |
| | 130 | | | | | 135 | | | | | 140 | | | | | | | | |
| Asn | Trp | Phe | Ser | Asn | Trp | Tyr | Asn | Leu | Asn | Lys | Leu | Ile | Leu | Glu | Phe | | | | |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 | | | | |
| Arg | Lys | Glu | Glu | Val | Ile | Arg | Thr | Gly | Ser | Ile | Leu | Cys | Arg | Ser | Leu | | | | |
| | | | | 165 | | | | | 170 | | | | | 175 | | | | | |
| Gly | Lys | Leu | Val | Phe | Val | Val | Ser | Ser | Tyr | Gly | Cys | Ile | Val | Lys | Ser | | | | |
| | | | 180 | | | | | 185 | | | | | 190 | | | | | | |
| Asn | Lys | Ser | Lys | Arg | Val | Ser | Phe | Phe | Thr | Tyr | Asn | Gln | Leu | Leu | Thr | | | | |
| | 195 | | | | | | 200 | | | | | 205 | | | | | | | |
| Trp | Lys | Asp | Val | Met | Leu | Ser | Arg | Phe | Asn | Ala | Asn | Phe | Cys | Ile | Trp | | | | |
| | 210 | | | | | 215 | | | | | 220 | | | | | | | | |
| Val | Ser | Asn | Ser | Leu | Asn | Glu | Asn | Gln | Glu | Gly | Leu | Gly | Leu | Arg | Ser | | | | |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 | | | | |
| Asn | Leu | Gln | Gly | Ile | Leu | Thr | Asn | Lys | Leu | Tyr | Glu | Thr | Val | Asp | Tyr | | | | |
| | | | | 245 | | | | | 250 | | | | | 255 | | | | | |
| Met | Leu | Ser | Leu | Cys | Cys | Asn | Glu | Gly | Phe | Ser | Leu | Val | Lys | Glu | Phe | | | | |
| | | | 260 | | | | | 265 | | | | | 270 | | | | | | |
| Glu | Gly | Phe | Ile | Met | Ser | Glu | Ile | Leu | Arg | Ile | Thr | Glu | His | Ala | Gln | | | | |
| | | 275 | | | | | 280 | | | | | 285 | | | | | | | |
| Phe | Ser | Thr | Arg | Phe | Arg | Asn | Thr | Leu | Leu | Asn | Gly | Leu | Thr | Asp | Gln | | | | |
| | 290 | | | | | 295 | | | | | 300 | | | | | | | | |
| Leu | Thr | Lys | Leu | Lys | Asn | Lys | Asn | Arg | Leu | Arg | Val | His | Gly | Thr | Val | | | | |
| 305 | | | | | 310 | | | | | 315 | | | | | 320 | | | | |
| Leu | Glu | Asn | Asn | Asp | Tyr | Pro | Met | Tyr | Glu | Val | Val | Leu | Lys | Leu | Leu | | | | |
| | | | | 325 | | | | | 330 | | | | | 335 | | | | | |
| Gly | Asp | Thr | Leu | Arg | Cys | Ile | Lys | Leu | Leu | Ile | Asn | Lys | Asn | Leu | Glu | | | | |
| | | | 340 | | | | | 345 | | | | | 350 | | | | | | |
| Asn | Ala | Ala | Glu | Leu | Tyr | Tyr | Ile | Phe | Arg | Ile | Phe | Gly | His | Pro | Met | | | | |
| | | 355 | | | | | 360 | | | | | 365 | | | | | | | |
| Val | Asp | Glu | Arg | Asp | Ala | Met | Asp | Ala | Val | Lys | Leu | Asn | Asn | Glu | Ile | | | | |
| | 370 | | | | | 375 | | | | | 380 | | | | | | | | |
| Thr | Lys | Ile | Leu | Arg | Trp | Glu | Ser | Leu | Thr | Glu | Leu | Arg | Gly | Ala | Phe | | | | |
| 385 | | | | | 390 | | | | | 395 | | | | | 400 | | | | |
| Ile | Leu | Arg | Ile | Ile | Lys | Gly | Phe | Val | Asp | Asn | Asn | Lys | Arg | Trp | Pro | | | | |
| | | | | 405 | | | | | 410 | | | | | 415 | | | | | |
| Lys | Ile | Lys | Asn | Leu | Lys | Val | Leu | Ser | Lys | Arg | Trp | Thr | Met | Tyr | Phe | | | | |
| | | | 420 | | | | | 425 | | | | | 430 | | | | | | |
| Lys | Ala | Lys | Ser | Tyr | Pro | Ser | Gln | Leu | Glu | Leu | Ser | Glu | Gln | Asp | Phe | | | | |
| | 435 | | | | | | 440 | | | | | 445 | | | | | | | |
| Leu | Glu | Leu | Ala | Ala | Ile | Gln | Phe | Glu | Gln | Glu | Phe | Ser | Val | Pro | Glu | | | | |
| | 450 | | | | | 455 | | | | | 460 | | | | | | | | |
| Lys | Thr | Asn | Leu | Glu | Met | Val | Leu | Asn | Asp | Lys | Ala | Ile | Ser | Pro | Pro | | | | |
| 465 | | | | | 470 | | | | | 475 | | | | | 480 | | | | |
| Lys | Arg | Leu | Ile | Trp | Ser | Val | Tyr | Pro | Lys | Asn | Tyr | Leu | Pro | Glu | Lys | | | | |
| | | | | 485 | | | | | 490 | | | | | 495 | | | | | |
| Ile | Lys | Asn | Arg | Tyr | Leu | Glu | Glu | Thr | Phe | Asn | Ala | Ser | Asp | Ser | Leu | | | | |
| | | | 500 | | | | | 505 | | | | | 510 | | | | | | |
| Lys | Thr | Arg | Arg | Val | Leu | Glu | Tyr | Leu | Lys | Asp | Asn | Lys | Phe | Asp | | | | | |
| | 515 | | | | | | 520 | | | | | 525 | | | | | | | |
| Gln | Lys | Glu | Leu | Lys | Ser | Tyr | Val | Val | Lys | Gln | Glu | Tyr | Leu | Asn | Asp | | | | |
| | 530 | | | | | 535 | | | | | 540 | | | | | | | | |
| Lys | Asp | His | Ile | Val | Ser | Leu | Thr | Gly | Lys | Glu | Arg | Glu | Leu | Ser | Val | | | | |
| 545 | | | | | 550 | | | | | 555 | | | | | 560 | | | | |
| Gly | Arg | Met | Phe | Ala | Met | Gln | Pro | Gly | Lys | Gln | Arg | Gln | Ile | Gln | Ile | | | | |
| | | | | 565 | | | | | 570 | | | | | 575 | | | | | |

Leu Ala Glu Lys Leu Leu Ala Asp Asn Ile Val Pro Phe Phe Pro Glu
 580 585 590
 Thr Leu Thr Lys Tyr Gly Asp Leu Asp Leu Gln Arg Ile Met Glu Ile
 595 600 605
 Lys Ser Glu Leu Ser Ser Ile Lys Thr Arg Arg Asn Asp Ser Tyr Asn
 610 615 620
 Asn Tyr Ile Ala Arg Ala Ser Ile Val Thr Asp Leu Ser Lys Phe Asn
 625 630 635 640
 Gln Ala Phe Arg Tyr Glu Thr Thr Ala Ile Cys Ala Asp Val Ala Asp
 645 650 655
 Glu Leu His Gly Thr Gln Ser Leu Phe Cys Trp Leu His Leu Ile Val
 660 665 670
 Pro Met Thr Thr Met Ile Cys Ala Tyr Arg His Ala Pro Pro Glu Thr
 675 680 685
 Lys Gly Glu Tyr Asp Ile Asp Lys Ile Glu Glu Gln Ser Gly Leu Tyr
 690 695 700
 Arg Tyr His Met Gly Gly Ile Glu Gly Trp Cys Gln Lys Leu Trp Thr
 705 710 715 720
 Met Glu Ala Ile Ser Leu Leu Asp Val Val Ser Val Lys Thr Arg Cys
 725 730 735
 Gln Met Thr Ser Leu Leu Asn Gly Asp Asn Gln Ser Ile Asp Val Ser
 740 745 750
 Lys Pro Val Lys Leu Ser Glu Gly Leu Asp Glu Val Lys Ala Asp Tyr
 755 760 765
 Ser Leu Ala Val Lys Met Leu Lys Glu Ile Arg Asp Ala Tyr Arg Asn
 770 775 780
 Ile Gly His Lys Leu Lys Glu Gly Glu Thr Tyr Ile Ser Arg Asp Leu
 785 790 795 800
 Gln Phe Ile Ser Lys Val Ile Gln Ser Glu Gly Val Met His Pro Thr
 805 810 815
 Pro Ile Lys Lys Ile Leu Arg Val Gly Pro Trp Ile Asn Thr Ile Leu
 820 825 830
 Asp Asp Ile Lys Thr Ser Ala Glu Ser Ile Gly Ser Leu Cys Gln Glu
 835 840 845
 Leu Glu Phe Arg Gly Glu Ser Ile Ile Val Ser Leu Ile Leu Arg Asn
 850 855 860
 Phe Trp Leu Tyr Asn Leu Tyr Met His Glu Ser Lys Gln His Pro Leu
 865 870 875 880
 Ala Gly Lys Gln Leu Phe Lys Gln Leu Asn Lys Thr Leu Thr Ser Val
 885 890 895
 Gln Arg Phe Phe Glu Ile Lys Lys Glu Asn Glu Val Val Asp Leu Trp
 900 905 910
 Met Asn Ile Pro Met Gln Phe Gly Gly Gly Asp Pro Val Val Phe Tyr
 915 920 925
 Arg Ser Phe Tyr Arg Arg Thr Pro Asp Phe Leu Thr Glu Ala Ile Ser
 930 935 940
 His Val Asp Ile Leu Leu Arg Ile Ser Ala Asn Ile Arg Asn Glu Ala
 945 950 955 960
 Lys Ile Ser Phe Phe Lys Ala Leu Leu Ser Ile Glu Lys Asn Glu Arg
 965 970 975
 Ala Thr Leu Thr Thr Leu Met Arg Asp Pro Gln Ala Val Gly Ser Glu
 980 985 990
 Arg Gln Ala Lys Val Thr Ser Asp Ile Asn Arg Thr Ala Val Thr Ser
 995 1000 1005
 Ile Leu Ser Leu Ser Pro Asn Gln Leu Phe Ser Asp Ser Ala Ile His
 1010 1015 1020
 Tyr Ser Arg Asn Glu Glu Glu Val Gly Ile Ile Ala Asp Asn Ile Thr
 1025 1030 1035 1040
 Pro Val Tyr Pro His Gly Leu Arg Val Leu Tyr Glu Ser Leu Pro Phe
 1045 1050 1055
 His Lys Ala Glu Lys Val Val Asn Met Ile Ser Gly Thr Lys Ser Ile

| | | |
|---|------|------|
| 1060 | 1065 | 1070 |
| Thr Asn Leu Leu Gln Arg Thr Ser Ala Ile Asn Gly Glu Asp Ile Asp | | |
| 1075 | 1080 | 1085 |
| Arg Ala Val Ser Met Met Leu Glu Asn Leu Gly Leu Leu Ser Arg Ile | | |
| 1090 | 1095 | 1100 |
| Leu Ser Val Val Val Asp Ser Ile Glu Ile Pro Thr Lys Ser Asn Gly | | |
| 1105 | 1110 | 1115 |
| Arg Leu Ile Cys Cys Gln Ile Ser Arg Thr Leu Arg Glu Thr Ser Trp | | |
| 1125 | 1130 | 1135 |
| Asn Asn Met Glu Ile Val Gly Val Thr Ser Pro Ser Ile Thr Thr Cys | | |
| 1140 | 1145 | 1150 |
| Met Asp Val Ile Tyr Ala Thr Ser Ser His Leu Lys Gly Ile Ile Ile | | |
| 1155 | 1160 | 1165 |
| Glu Lys Phe Ser Thr Asp Arg Thr Thr Arg Gly Gln Arg Gly Pro Lys | | |
| 1170 | 1175 | 1180 |
| Ser Pro Trp Val Gly Ser Ser Thr Gln Glu Lys Lys Leu Val Pro Val | | |
| 1185 | 1190 | 1195 |
| Tyr Asn Arg Gln Ile Leu Ser Lys Gln Gln Arg Glu Gln Leu Glu Ala | | |
| 1205 | 1210 | 1215 |
| Ile Gly Lys Met Arg Trp Val Tyr Lys Gly Thr Pro Gly Leu Arg Arg | | |
| 1220 | 1225 | 1230 |
| Leu Leu Asn Lys Ile Cys Leu Gly Ser Leu Gly Ile Ser Tyr Lys Cys | | |
| 1235 | 1240 | 1245 |
| Val Lys Pro Leu Leu Pro Arg Phe Met Ser Val Asn Phe Leu His Arg | | |
| 1250 | 1255 | 1260 |
| Leu Ser Val Ser Ser Arg Pro Met Glu Phe Pro Ala Ser Val Pro Ala | | |
| 1265 | 1270 | 1275 |
| Tyr Arg Thr Thr Asn Tyr His Phe Asp Thr Ser Pro Ile Asn Gln Ala | | |
| 1285 | 1290 | 1295 |
| Leu Ser Glu Arg Phe Gly Asn Glu Asp Ile Asn Leu Val Phe Gln Asn | | |
| 1300 | 1305 | 1310 |
| Ala Ile Ser Cys Gly Ile Ser Ile Met Ser Val Val Glu Gln Leu Thr | | |
| 1315 | 1320 | 1325 |
| Gly Arg Ser Pro Lys Gln Leu Val Leu Ile Pro Gln Leu Glu Glu Ile | | |
| 1330 | 1335 | 1340 |
| Asp Ile Met Pro Pro Pro Val Phe Gln Gly Lys Phe Asn Tyr Lys Leu | | |
| 1345 | 1350 | 1355 |
| Val Asp Lys Ile Thr Ser Asp Gln His Ile Phe Ser Pro Asp Lys Ile | | |
| 1365 | 1370 | 1375 |
| Asp Met Leu Thr Leu Gly Lys Met Leu Met Pro Thr Ile Lys Gly Gln | | |
| 1380 | 1385 | 1390 |
| Lys Thr Asp Gln Phe Leu Asn Lys Arg Glu Asn Tyr Phe His Gly Asn | | |
| 1395 | 1400 | 1405 |
| Asn Leu Ile Glu Ser Leu Ser Ala Ala Leu Ala Cys His Trp Cys Gly | | |
| 1410 | 1415 | 1420 |
| Ile Leu Thr Glu Gln Cys Ile Glu Asn Asn Ile Phe Lys Lys Asp Trp | | |
| 1425 | 1430 | 1435 |
| Gly Asp Gly Phe Ile Ser Asp His Ala Phe Met Asp Phe Lys Ile Phe | | |
| 1445 | 1450 | 1455 |
| Leu Cys Val Phe Lys Thr Lys Leu Leu Cys Ser Trp Gly Ser Gln Gly | | |
| 1460 | 1465 | 1470 |
| Lys Asn Ile Lys Asp Glu Asp Ile Val Asp Glu Ser Ile Asp Lys Leu | | |
| 1475 | 1480 | 1485 |
| Leu Arg Ile Asp Asn Thr Phe Trp Arg Met Phe Ser Lys Val Met Phe | | |
| 1490 | 1495 | 1500 |
| Glu Ser Lys Val Lys Lys Arg Ile Met Leu Tyr Asp Val Lys Phe Leu | | |
| 1505 | 1510 | 1515 |
| Ser Leu Val Gly Tyr Ile Gly Phe Lys Asn Trp Phe Ile Glu Gln Leu | | |
| 1525 | 1530 | 1535 |
| Arg Ser Ala Glu Leu His Glu Val Pro Trp Ile Val Asn Ala Glu Gly | | |
| 1540 | 1545 | 1550 |

Asp Leu Val Glu Ile Lys Ser Ile Lys Ile Tyr Leu Gln Leu Ile Glu
 1555 1560 1565
 Gln Ser Leu Phe Leu Arg Ile Thr Val Leu Asn Tyr Thr Asp Met Ala
 1570 1575 1580
 His Ala Leu Thr Arg Leu Ile Arg Lys Lys Leu Met Cys Asp Asn Ala
 1585 1590 1595 1600
 Leu Leu Thr Pro Ile Pro Ser Pro Met Val Asn Leu Thr Gln Val Ile
 1605 1610 1615
 Asp Pro Thr Glu Gln Leu Ala Tyr Phe Pro Lys Ile Thr Phe Glu Arg
 1620 1625 1630
 Leu Lys Asn Tyr Asp Thr Ser Ser Asn Tyr Ala Lys Gly Lys Leu Thr
 1635 1640 1645
 Arg Asn Tyr Met Ile Leu Leu Pro Trp Gln His Val Asn Arg Tyr Asn
 1650 1655 1660
 Phe Val Phe Ser Ser Thr Gly Cys Lys Val Ser Leu Lys Thr Cys Ile
 1665 1670 1675 1680
 Gly Lys Leu Met Lys Asp Leu Asn Pro Lys Val Leu Tyr Phe Ile Gly
 1685 1690 1695
 Glu Gly Ala Gly Asn Trp Met Ala Arg Thr Ala Cys Glu Tyr Pro Asp
 1700 1705 1710
 Ile Lys Phe Val Tyr Arg Ser Leu Lys Asp Asp Leu Asp His His Tyr
 1715 1720 1725
 Pro Leu Glu Tyr Gln Arg Val Ile Gly Glu Leu Ser Arg Ile Ile Asp
 1730 1735 1740
 Ser Gly Glu Gly Leu Ser Met Glu Thr Thr Asp Ala Thr Gln Lys Thr
 1745 1750 1755 1760
 His Trp Asp Leu Ile His Arg Val Ser Lys Asp Ala Leu Leu Ile Thr
 1765 1770 1775
 Leu Cys Asp Ala Glu Phe Lys Asp Arg Asp Asp Phe Phe Lys Met Val
 1780 1785 1790
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 1795 1800 1805
 Gly Thr Asp Leu Tyr Leu Phe Ala Lys Tyr His Ala Lys Asp Cys Asn
 1810 1815 1820
 Val Lys Leu Pro Phe Phe Val Arg Ser Val Ala Thr Phe Ile Met Gln
 1825 1830 1835 1840
 Gly Ser Lys Leu Ser Gly Ser Glu Cys Tyr Ile Leu Leu Thr Leu Gly
 1845 1850 1855
 His His Asn Asn Leu Pro Cys His Gly Glu Ile Gln Asn Ser Lys Met
 1860 1865 1870
 Lys Ile Ala Val Cys Asn Asp Phe Tyr Ala Ala Lys Lys Leu Asp Asn
 1875 1880 1885
 Lys Ser Ile Glu Ala Asn Cys Lys Ser Leu Leu Ser Gly Leu Arg Ile
 1890 1895 1900
 Pro Ile Asn Lys Lys Glu Leu Asn Arg Gln Arg Leu Leu Thr Leu
 1905 1910 1915 1920
 Gln Ser Asn His Ser Ser Val Ala Thr Val Gly Gly Ser Lys Val Ile
 1925 1930 1935
 Glu Ser Lys Trp Leu Thr Asn Lys Ala Asn Thr Ile Ile Asp Trp Leu
 1940 1945 1950
 Glu His Ile Leu Asn Ser Pro Lys Gly Glu Leu Asn Tyr Asp Phe Phe
 1955 1960 1965
 Glu Ala Leu Glu Asn Thr Tyr Pro Asn Met Ile Lys Leu Ile Asp Asn
 1970 1975 1980
 Leu Gly Asn Ala Glu Ile Lys Lys Leu Ile Lys Val Thr Gly Tyr Met
 1985 1990 1995 2000
 Leu Val Ser Lys Lys
 2005

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 <211> 13350

<212> DNA

<213> Human metapneumovirus

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<223> RNA-dependent RNA polymerase (L) of Human metapneumovirus

<400> 406

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gatgtgggta caacaactgc agtgacaccc tcatcattgc aacaagaaat aacactgttg 180
tgtggagaaa ttctgtatgc taaacatgct gactacaaat atgctgcaga aataggaata 240
caatatatta gcacagcttt aggatcagag agagtgcagc agattctgag gaactcaggc 300
agtgaagtcc aagtggctctt aaccagaacg tactctctgg ggaaaattaa aaacaataaa 360
ggagaagatt tacagatggt agacatacac ggggtagaga agagctgggt agaagagata 420
gacaaagaag caaggaaaac aatggcaacc ttgcttaagg aatcatcagg taatatccca 480
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Asp Val Val Glu Gly Arg Trp Asn Met Ser Ser Ala Gly Arg Leu Asp
245 250 255
Lys Arg Ser Ser Lys Ile Thr Cys Lys Gly Glu Glu Leu Trp Glu Leu
260 265 270
Ile Asp Ser Leu Phe Pro Asn Leu Gly Glu Asp Val Tyr Asn Ile Ile
275 280 285
Ser Leu Leu Glu Pro Leu Ser Leu Ala Leu Ile Gln Leu Asp Asp Pro
290 295 300
Val Thr Asn Leu Lys Gly Ala Phe Met Arg His Val Leu Thr Glu Leu
305 310 315 320
His Thr Ile Leu Ile Lys Asp Asn Ile Tyr Thr Asp Ser Glu Ala Asp
325 330 335
Ser Ile Met Glu Ser Leu Ile Lys Ile Phe Arg Glu Thr Ser Ile Asp

| | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| Ser | Lys | Arg | Ile | Tyr | Tyr | Asp | Gly | Lys | Ile | Leu | Pro | Gln | Cys | Leu | Lys | 835 | 840 | 845 |
| Ala | Leu | Thr | Arg | Cys | Val | Phe | Trp | Ser | Glu | Thr | Leu | Val | Asp | Glu | Asn | 850 | 855 | 860 |
| Arg | Ser | Ala | Cys | Ser | Asn | Ile | Ala | Thr | Ser | Ile | Ala | Lys | Ala | Ile | Glu | 865 | 870 | 875 |
| Asn | Gly | Tyr | Ser | Pro | Ile | Leu | Gly | Tyr | Cys | Ile | Ala | Leu | Phe | Lys | Thr | 885 | 890 | 895 |
| Cys | Gln | Gln | Val | Cys | Ile | Ser | Leu | Gly | Met | Thr | Ile | Asn | Pro | Thr | Ile | 900 | 905 | 910 |
| Thr | Ser | Thr | Ile | Lys | Asp | Gln | Tyr | Phe | Lys | Gly | Lys | Asn | Trp | Leu | Arg | 915 | 920 | 925 |
| Cys | Ala | Ile | Leu | Ile | Pro | Ala | Asn | Ile | Gly | Gly | Phe | Asn | Tyr | Met | Ser | 930 | 935 | 940 |
| Thr | Ala | Arg | Cys | Phe | Val | Arg | Asn | Ile | Gly | Asp | Pro | Ala | Val | Ala | Ala | 945 | 950 | 955 |
| Leu | Ala | Asp | Leu | Lys | Arg | Phe | Ile | Lys | Ala | Gly | Leu | Leu | Asp | Lys | Gln | 965 | 970 | 975 |
| Val | Leu | Tyr | Arg | Val | Met | Asn | Gln | Glu | Pro | Gly | Asp | Ser | Ser | Phe | Leu | 980 | 985 | 990 |
| Asp | Trp | Ala | Ser | Asp | Pro | Tyr | Ser | Cys | Asn | Leu | Pro | His | Ser | Gln | Ser | 995 | 1000 | 1005 |
| Ile | Thr | Thr | Ile | Ile | Lys | Asn | Val | Thr | Ala | Arg | Ser | Val | Leu | Gln | Glu | 1010 | 1015 | 1020 |
| Ser | Pro | Asn | Pro | Leu | Leu | Ser | Gly | Leu | Phe | Ser | Glu | Ser | Ser | Ser | Glu | 1025 | 1030 | 1035 |
| Glu | Asp | Leu | Asn | Leu | Ala | Ser | Phe | Leu | Met | Asp | Arg | Lys | Ala | Ile | Leu | 1045 | 1050 | 1055 |
| Pro | Arg | Val | Ala | His | Glu | Ile | Leu | Asp | Asn | Ser | Leu | Thr | Gly | Val | Arg | 1060 | 1065 | 1070 |
| Glu | Ala | Ile | Ala | Gly | Met | Leu | Asp | Thr | Thr | Lys | Ser | Leu | Val | Arg | Ala | 1075 | 1080 | 1085 |
| Ser | Val | Arg | Arg | Gly | Gly | Leu | Ser | Tyr | Ser | Ile | Leu | Arg | Arg | Leu | Ile | 1090 | 1095 | 1100 |
| Asn | Tyr | Asp | Leu | Leu | Gln | Tyr | Glu | Thr | Leu | Thr | Arg | Thr | Leu | Arg | Lys | 1105 | 1110 | 1115 |
| Pro | Val | Lys | Asp | Asn | Ile | Glu | Tyr | Glu | Tyr | Met | Cys | Ser | Val | Glu | Leu | 1125 | 1130 | 1135 |
| Ala | Ile | Gly | Leu | Arg | Gln | Lys | Met | Trp | Phe | His | Leu | Thr | Tyr | Gly | Arg | 1140 | 1145 | 1150 |
| Pro | Ile | His | Gly | Leu | Glu | Thr | Pro | Asp | Pro | Leu | Glu | Leu | Leu | Arg | Gly | 1155 | 1160 | 1165 |
| Ser | Phe | Ile | Glu | Gly | Ser | Glu | Ile | Cys | Lys | Phe | Cys | Arg | Ser | Glu | Gly | 1170 | 1175 | 1180 |
| Asn | Asn | Pro | Met | Tyr | Thr | Trp | Phe | Tyr | Leu | Pro | Asp | Asn | Ile | Asp | Leu | 1185 | 1190 | 1195 |
| Asp | Thr | Leu | Ser | Asn | Gly | Ser | Pro | Ala | Ile | Arg | Ile | Pro | Tyr | Phe | Gly | 1205 | 1210 | 1215 |
| Ser | Ala | Thr | Asp | Glu | Arg | Ser | Glu | Ala | Gln | Leu | Gly | Tyr | Val | Lys | Asn | 1220 | 1225 | 1230 |
| Leu | Ser | Lys | Pro | Ala | Lys | Ala | Ala | Ile | Arg | Ile | Ala | Met | Val | Tyr | Thr | 1235 | 1240 | 1245 |
| Trp | Ala | Tyr | Gly | Thr | Asp | Glu | Ile | Ser | Trp | Met | Glu | Ala | Ala | Leu | Ile | 1250 | 1255 | 1260 |
| Ala | Gln | Thr | Arg | Ala | Asn | Leu | Ser | Leu | Glu | Asn | Leu | Lys | Leu | Leu | Thr | 1265 | 1270 | 1275 |
| Pro | Val | Ser | Thr | Ser | Thr | Asn | Leu | Ser | His | Arg | Leu | Arg | Asp | Thr | Ala | 1285 | 1290 | 1295 |
| Thr | Gln | Met | Lys | Phe | Ser | Ser | Ala | Thr | Leu | Val | Arg | Ala | Ser | Arg | Phe | 1300 | 1305 | 1310 |
| Ile | Thr | Ile | Ser | Asn | Asp | Asn | Met | Ala | Leu | Lys | Glu | Ala | Gly | Glu | Ser | | | |

| | | |
|---|------|------|
| 1315 | 1320 | 1325 |
| Lys Asp Thr Asn Leu Val Tyr Gln Gln Ile Met Leu Thr Gly Leu Ser | | |
| 1330 | 1335 | 1340 |
| Leu Phe Glu Phe Asn Met Arg Tyr Lys Gln Gly Ser Leu Ser Lys Pro | | |
| 1345 | 1350 | 1355 |
| Met Ile Leu His Leu His Leu Asn Asn Lys Cys Cys Ile Ile Glu Ser | | 1360 |
| 1365 | 1370 | 1375 |
| Pro Gln Glu Leu Asn Ile Pro Pro Arg Ser Thr Leu Asp Leu Glu Ile | | |
| 1380 | 1385 | 1390 |
| Thr Gln Glu Asn Asn Lys Leu Ile Tyr Asp Pro Asp Pro Leu Lys Asp | | |
| 1395 | 1400 | 1405 |
| Ile Asp Leu Glu Leu Phe Ser Lys Val Arg Asp Val Val His Thr Ile | | |
| 1410 | 1415 | 1420 |
| Asp Met Asn Tyr Trp Ser Asp Asp Glu Ile Ile Arg Ala Thr Ser Ile | | |
| 1425 | 1430 | 1435 |
| Cys Thr Ala Met Thr Ile Ala Asp Thr Met Ser Gln Leu Asp Arg Asp | | 1440 |
| 1445 | 1450 | 1455 |
| Asn Leu Lys Glu Met Ile Ala Leu Ile Asn Asp Asp Asp Ile Asn Ser | | |
| 1460 | 1465 | 1470 |
| Leu Ile Thr Glu Phe Met Val Ile Asp Ile Pro Leu Phe Cys Ser Thr | | |
| 1475 | 1480 | 1485 |
| Phe Gly Gly Ile Leu Ile Asn Gln Phe Ala Tyr Ser Leu Tyr Gly Leu | | |
| 1490 | 1495 | 1500 |
| Asn Val Arg Gly Arg Asp Glu Ile Trp Gly Tyr Val Ile Arg Ile Ile | | |
| 1505 | 1510 | 1515 |
| Lys Asp Thr Ser His Ala Val Leu Lys Val Leu Ser Asn Ala Leu Ser | | 1520 |
| 1525 | 1530 | 1535 |
| His Pro Lys Ile Phe Lys Arg Phe Trp Asp Ala Gly Val Val Glu Pro | | |
| 1540 | 1545 | 1550 |
| Val Tyr Gly Pro Asn Leu Ser Asn Gln Asp Lys Ile Leu Leu Ala Ile | | |
| 1555 | 1560 | 1565 |
| Ser Val Cys Glu Tyr Ser Val Asp Leu Phe Met Arg Asp Trp Gln Glu | | |
| 1570 | 1575 | 1580 |
| Gly Ile Pro Leu Glu Ile Phe Ile Cys Asp Asn Asp Pro Asn Ile Ala | | |
| 1585 | 1590 | 1595 |
| Glu Met Arg Lys Leu Ser Phe Leu Ala Arg His Leu Ala Tyr Leu Cys | | 1600 |
| 1605 | 1610 | 1615 |
| Ser Leu Ala Glu Ile Ala Lys Glu Gly Pro Lys Leu Glu Ser Met Thr | | |
| 1620 | 1625 | 1630 |
| Ser Leu Glu Arg Leu Glu Ser Leu Lys Glu Tyr Leu Glu Leu Thr Phe | | |
| 1635 | 1640 | 1645 |
| Leu Asp Asp Pro Ile Leu Arg Tyr Ser Gln Leu Thr Gly Leu Val Ile | | |
| 1650 | 1655 | 1660 |
| Lys Ile Phe Pro Ser Thr Leu Thr Tyr Ile Arg Lys Ser Ser Ile Lys | | |
| 1665 | 1670 | 1675 |
| Val Leu Arg Val Arg Gly Ile Gly Ile Pro Glu Val Leu Glu Asp Trp | | 1680 |
| 1685 | 1690 | 1695 |
| Asp Pro Asp Ala Asp Ser Met Leu Leu Asp Asn Ile Thr Ala Glu Val | | |
| 1700 | 1705 | 1710 |
| Gln His Asn Ile Pro Leu Lys Lys Asn Glu Arg Thr Pro Phe Trp Gly | | |
| 1715 | 1720 | 1725 |
| Leu Arg Val Ser Lys Ser Gln Val Leu Arg Leu Arg Gly Tyr Glu Glu | | |
| 1730 | 1735 | 1740 |
| Ile Lys Arg Glu Glu Arg Gly Arg Ser Gly Val Gly Leu Thr Leu Pro | | |
| 1745 | 1750 | 1755 |
| Phe Asp Gly Arg Tyr Leu Ser His Gln Leu Arg Leu Phe Gly Ile Asn | | 1760 |
| 1765 | 1770 | 1775 |
| Ser Thr Ser Cys Leu Lys Ala Leu Glu Leu Thr Tyr Leu Leu Asn Pro | | |
| 1780 | 1785 | 1790 |
| Leu Val Asn Lys Asp Lys Asp Arg Leu Tyr Leu Gly Glu Gly Ala Gly | | |
| 1795 | 1800 | 1805 |

| | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| Ala | Met | Leu | Ser | Cys | Tyr | Asp | Ala | Thr | Leu | Gly | Pro | Cys | Met | Asn | Tyr | 1810 | 1815 | 1820 |
| Tyr | Asn | Ser | Gly | Val | Asn | Ser | Cys | Asp | Leu | Asn | Gly | Gln | Arg | Glu | Leu | 1825 | 1830 | 1835 |
| Asn | Ile | Tyr | Pro | Ser | Glu | Val | Ala | Leu | Val | Gly | Lys | Lys | Leu | Asn | Asn | 1845 | 1850 | 1855 |
| Val | Thr | Ser | Leu | Cys | Gln | Arg | Val | Lys | Val | Leu | Phe | Asn | Gly | Asn | Pro | 1860 | 1865 | 1870 |
| Gly | Ser | Thr | Trp | Ile | Gly | Asn | Asp | Glu | Cys | Glu | Thr | Leu | Ile | Trp | Asn | 1875 | 1880 | 1885 |
| Glu | Leu | Gln | Asn | Asn | Ser | Ile | Gly | Phe | Ile | His | Cys | Asp | Met | Glu | Gly | 1890 | 1895 | 1900 |
| Gly | Glu | His | Lys | Cys | Asp | Gln | Val | Val | Leu | His | Glu | His | Tyr | Ser | Val | 1905 | 1910 | 1915 |
| Ile | Arg | Ile | Ala | Tyr | Leu | Val | Gly | Asp | Lys | Asp | Val | Ile | Leu | Val | Ser | 1925 | 1930 | 1935 |
| Lys | Ile | Ala | Pro | Arg | Leu | Gly | Thr | Asp | Trp | Thr | Lys | Gln | Leu | Ser | Leu | 1940 | 1945 | 1950 |
| Tyr | Leu | Arg | Tyr | Trp | Arg | Asp | Val | Ser | Leu | Ile | Val | Leu | Lys | Thr | Ser | 1955 | 1960 | 1965 |
| Asn | Pro | Ala | Ser | Thr | Glu | Met | Tyr | Leu | Ile | Ser | Lys | Asp | Pro | Lys | Ser | 1970 | 1975 | 1980 |
| Asp | Ile | Ile | Glu | Asp | Ser | Asn | Thr | Val | Leu | Ala | Asn | Leu | Leu | Pro | Leu | 1985 | 1990 | 1995 |
| Ser | Lys | Glu | Asp | Ser | Ile | Lys | Ile | Glu | Lys | Trp | Ile | Leu | Val | Glu | Lys | 2005 | 2010 | 2015 |
| Ala | Lys | Val | His | Asp | Trp | Ile | Val | Arg | Glu | Leu | Lys | Glu | Gly | Ser | Ala | 2020 | 2025 | 2030 |
| Ser | Ser | Gly | Met | Leu | Arg | Pro | Tyr | His | Gln | Ala | Leu | Gln | Ile | Phe | Gly | 2035 | 2040 | 2045 |
| Phe | Glu | Pro | Asn | Leu | Asn | Lys | Leu | Cys | Arg | Asp | Phe | Leu | Ser | Thr | Leu | 2050 | 2055 | 2060 |
| Asn | Ile | Val | Asp | Thr | Lys | Asn | Cys | Ile | Ile | Thr | Phe | Asp | Arg | Val | Leu | 2065 | 2070 | 2075 |
| Arg | Asp | Thr | Ile | Phe | Glu | Trp | Thr | Arg | Ile | Lys | Asp | Ala | Asp | Lys | Lys | 2085 | 2090 | 2095 |
| Leu | Arg | Leu | Thr | Gly | Lys | Tyr | Asp | Leu | Tyr | Pro | Leu | Arg | Asp | Ser | Gly | 2100 | 2105 | 2110 |
| Lys | Leu | Lys | Val | Ile | Ser | Arg | Arg | Leu | Val | Ile | Ser | Trp | Ile | Ala | Leu | 2115 | 2120 | 2125 |
| Ser | Met | Ser | Thr | Arg | Leu | Val | Thr | Gly | Ser | Phe | Pro | Asp | Ile | Lys | Phe | 2130 | 2135 | 2140 |
| Glu | Ser | Arg | Leu | Gln | Leu | Gly | Ile | Val | Ser | Ile | Ser | Ser | Arg | Glu | Ile | 2145 | 2150 | 2155 |
| Lys | Asn | Leu | Arg | Val | Ile | Ser | Lys | Ile | Val | Ile | Asp | Lys | Phe | Glu | Asp | 2165 | 2170 | 2175 |
| Ile | Ile | His | Ser | Val | Thr | Tyr | Arg | Phe | Leu | Thr | Lys | Glu | Ile | Lys | Ile | 2180 | 2185 | 2190 |
| Leu | Met | Lys | Ile | Leu | Gly | Ala | Val | Lys | Leu | Phe | Gly | Ala | Arg | Gln | Ser | 2195 | 2200 | 2205 |
| Thr | Ser | Ala | Asp | Ile | Thr | Asn | Ile | Asp | Thr | Ser | Asp | Ser | Ile | Gln | | 2210 | 2215 | 2220 |

<210> 409

<211> 575

<212> PRT

<213> Human parainfluenza virus 1 strain Washington/1964

<220>

<223> HN glycoprotein of Human parainfluenza 1 virus

<400> 409

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ala | Glu | Lys | Gly | Lys | Thr | Asn | Ser | Ser | Tyr | Trp | Ser | Thr | Thr | Arg |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Asn | Asp | Asn | Ser | Thr | Val | Asn | Thr | His | Ile | Asn | Thr | Pro | Ala | Gly | Arg |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Thr | His | Ile | Trp | Leu | Leu | Ile | Ala | Thr | Thr | Met | His | Thr | Val | Leu | Ser |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Phe | Ile | Ile | Met | Ile | Leu | Cys | Ile | Asp | Leu | Ile | Ile | Lys | Gln | Asp | Thr |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Cys | Met | Lys | Thr | Asn | Ile | Met | Thr | Val | Ser | Ser | Met | Asn | Glu | Ser | Ala |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Lys | Ile | Ile | Lys | Glu | Thr | Ile | Thr | Glu | Leu | Ile | Arg | Gln | Glu | Val | Ile |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Ser | Arg | Thr | Ile | Asn | Ile | Gln | Ser | Ser | Val | Gln | Ser | Gly | Ile | Pro | Ile |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Leu | Leu | Asn | Lys | Gln | Ser | Arg | Asp | Leu | Thr | Gln | Leu | Ile | Glu | Lys | Ser |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Cys | Asn | Arg | Gln | Glu | Leu | Ala | Gln | Ile | Cys | Glu | Asn | Thr | Ile | Ala | Ile |
| | 130 | | | | | 135 | | | | | | 140 | | | |
| His | His | Ala | Asp | Gly | Ile | Ser | Pro | Leu | Asp | Pro | His | Asp | Phe | Trp | Arg |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Cys | Pro | Val | Gly | Glu | Pro | Leu | Leu | Ser | Asn | Asn | Pro | Asn | Ile | Ser | Leu |
| | | | | 165 | | | | | 170 | | | | | 175 | |
| Leu | Pro | Gly | Pro | Ser | Leu | Leu | Ser | Gly | Ser | Thr | Thr | Ile | Ser | Gly | Cys |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Val | Arg | Leu | Pro | Ser | Leu | Ser | Ile | Gly | Asp | Ala | Ile | Tyr | Ala | Tyr | Ser |
| | | 195 | | | | | 200 | | | | | 205 | | | |
| Ser | Asn | Leu | Ile | Thr | Gln | Gly | Cys | Ala | Asp | Ile | Gly | Lys | Ser | Tyr | Gln |
| | 210 | | | | | 215 | | | | | | 220 | | | |
| Val | Leu | Gln | Leu | Gly | Tyr | Ile | Ser | Leu | Asn | Ser | Asp | Met | Tyr | Pro | Asp |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 |
| Leu | Asn | Pro | Val | Ile | Ser | His | Thr | Tyr | Asp | Ile | Asn | Asp | Asn | Arg | Lys |
| | | | | 245 | | | | | 250 | | | | | 255 | |
| Ser | Cys | Ser | Val | Ile | Ala | Ala | Gly | Thr | Arg | Gly | Tyr | Gln | Leu | Cys | Ser |
| | | | 260 | | | | | 265 | | | | | 270 | | |
| Leu | Pro | Thr | Val | Asn | Glu | Thr | Thr | Asp | Tyr | Ser | Ser | Glu | Gly | Ile | Glu |
| | | 275 | | | | | 280 | | | | | | 285 | | |
| Asp | Leu | Val | Phe | Asp | Ile | Leu | Asp | Leu | Lys | Gly | Lys | Thr | Lys | Ser | His |
| | 290 | | | | | 295 | | | | | 300 | | | | |
| Arg | Tyr | Lys | Asn | Glu | Asp | Ile | Thr | Phe | Asp | His | Pro | Phe | Ser | Ala | Met |
| 305 | | | | | 310 | | | | | 315 | | | | | 320 |
| Tyr | Pro | Ser | Val | Gly | Ser | Gly | Ile | Lys | Ile | Glu | Asn | Thr | Leu | Ile | Phe |
| | | | | 325 | | | | | 330 | | | | | 335 | |
| Leu | Gly | Tyr | Gly | Gly | Leu | Thr | Thr | Pro | Leu | Gln | Gly | Asp | Thr | Lys | Cys |
| | | | 340 | | | | | 345 | | | | | 350 | | |
| Val | Ile | Asn | Arg | Cys | Thr | Asn | Val | Asn | Gln | Ser | Val | Cys | Asn | Asp | Ala |
| | | 355 | | | | | 360 | | | | | 365 | | | |
| Leu | Lys | Ile | Thr | Trp | Leu | Lys | Lys | Arg | Gln | Val | Val | Asn | Val | Leu | Ile |
| | 370 | | | | | 375 | | | | | 380 | | | | |
| Arg | Ile | Asn | Asn | Tyr | Leu | Ser | Asp | Arg | Pro | Lys | Ile | Val | Val | Glu | Thr |
| 385 | | | | | 390 | | | | | 395 | | | | | 400 |
| Ile | Pro | Ile | Thr | Gln | Asn | Tyr | Leu | Gly | Ala | Glu | Gly | Arg | Leu | Leu | Lys |
| | | | | 405 | | | | | 410 | | | | | 415 | |
| Leu | Gly | Lys | Lys | Ile | Tyr | Ile | Tyr | Thr | Arg | Ser | Ser | Gly | Trp | His | Ser |
| | | | 420 | | | | | 425 | | | | | 430 | | |
| Asn | Leu | Gln | Ile | Gly | Ser | Leu | Asp | Ile | Asn | Asn | Pro | Met | Thr | Ile | Lys |
| | | 435 | | | | | 440 | | | | | 445 | | | |
| Trp | Ala | Pro | His | Glu | Val | Leu | Ser | Arg | Pro | Gly | Asn | Gln | Asp | Cys | Asn |
| | 450 | | | | | 455 | | | | | 460 | | | | |
| Trp | Tyr | Asn | Arg | Cys | Pro | Arg | Glu | Cys | Ile | Ser | Gly | Val | Tyr | Thr | Asp |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 465 | | | | | 470 | | | | | 475 | | | | | 480 |
| Ala | Tyr | Pro | Leu | Ser | Pro | Asp | Ala | Val | Asn | Val | Ala | Thr | Thr | Thr | Leu |
| | | | | 485 | | | | | 490 | | | | | | 495 |
| Tyr | Ala | Asn | Thr | Ser | Arg | Val | Asn | Pro | Thr | Ile | Met | Tyr | Ser | Asn | Thr |
| | | | 500 | | | | | 505 | | | | | 510 | | |
| Ser | Glu | Ile | Ile | Asn | Met | Leu | Arg | Leu | Lys | Asn | Val | Gln | Leu | Glu | Ala |
| | | 515 | | | | 520 | | | | | 525 | | | | |
| Ala | Tyr | Thr | Thr | Thr | Ser | Cys | Ile | Thr | His | Phe | Gly | Lys | Gly | Tyr | Cys |
| | 530 | | | | 535 | | | | | 540 | | | | | |
| Phe | His | Ile | Val | Glu | Ile | Asn | Gln | Ala | Ser | Leu | Asn | Thr | Leu | Gln | Pro |
| 545 | | | | | 550 | | | | 555 | | | | | | 560 |
| Met | Leu | Phe | Lys | Thr | Ser | Ile | Pro | Lys | Ile | Cys | Lys | Ile | Thr | Ser | |
| | | | 565 | | | | | 570 | | | | | 575 | | |

<210> 410

<211> 348

<212> PRT

<213> Human parainfluenza virus 1 strain Washington/1964

<220>

<223> matrix protein of Human parainfluenza 1 virus

<400> 410

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ala | Glu | Thr | Tyr | Arg | Phe | Pro | Arg | Phe | Ser | His | Glu | Glu | Asn | Gly |
| 1 | | | | 5 | | | | 10 | | | | | | 15 | |
| Thr | Val | Glu | Pro | Leu | Pro | Leu | Lys | Thr | Gly | Pro | Asp | Lys | Lys | Ala | Ile |
| | | 20 | | | | | 25 | | | | | | 30 | | |
| Pro | His | Ile | Arg | Ile | Val | Lys | Val | Gly | Asp | Pro | Pro | Lys | His | Gly | Val |
| | 35 | | | | | 40 | | | | | 45 | | | | |
| Arg | Tyr | Leu | Asp | Val | Leu | Leu | Leu | Gly | Phe | Phe | Glu | Thr | Pro | Lys | Gln |
| | 50 | | | | 55 | | | | 60 | | | | | | |
| Gly | Pro | Leu | Ser | Gly | Ser | Ile | Ser | Asp | Leu | Thr | Glu | Ser | Thr | Ser | Tyr |
| 65 | | | | 70 | | | | 75 | | | | | | 80 | |
| Ser | Ile | Cys | Gly | Ser | Gly | Ser | Leu | Pro | Ile | Gly | Ile | Ala | Lys | Tyr | Tyr |
| | | 85 | | | | 90 | | | | | | | 95 | | |
| Gly | Thr | Asp | Gln | Glu | Leu | Leu | Lys | Ala | Cys | Ile | Asp | Leu | Lys | Ile | Thr |
| | | 100 | | | | | 105 | | | | | | 110 | | |
| Val | Arg | Arg | Thr | Val | Arg | Ser | Gly | Glu | Met | Ile | Val | Tyr | Met | Val | Asp |
| | 115 | | | | | 120 | | | | | | 125 | | | |
| Ser | Ile | His | Ala | Pro | Leu | Leu | Pro | Trp | Ser | Ser | Arg | Leu | Arg | Gln | Gly |
| | 130 | | | | 135 | | | | | 140 | | | | | |
| Met | Ile | Tyr | Asn | Ala | Asn | Lys | Val | Ala | Leu | Ala | Pro | Gln | Cys | Leu | Pro |
| 145 | | | | 150 | | | | 155 | | | | | | 160 | |
| Val | Asp | Lys | Asp | Ile | Arg | Phe | Arg | Val | Val | Phe | Val | Asn | Gly | Thr | Ser |
| | | 165 | | | | | 170 | | | | | | 175 | | |
| Leu | Gly | Thr | Ile | Thr | Ile | Ala | Lys | Val | Pro | Lys | Thr | Leu | Ala | Asp | Leu |
| | | 180 | | | | | 185 | | | | | 190 | | | |
| Ala | Leu | Pro | Asn | Ser | Ile | Ser | Val | Asn | Leu | Leu | Val | Thr | Leu | Arg | Ala |
| | 195 | | | | | 200 | | | | | 205 | | | | |
| Gly | Val | Ser | Thr | Glu | Gln | Lys | Gly | Ile | Leu | Pro | Val | Leu | Asp | Asp | Asp |
| | 210 | | | | 215 | | | | | 220 | | | | | |
| Gly | Glu | Lys | Lys | Leu | Asn | Phe | Met | Val | His | Leu | Gly | Ile | Ile | Arg | Arg |
| 225 | | | | 230 | | | | 235 | | | | | | 240 | |
| Lys | Val | Gly | Lys | Ile | Tyr | Ser | Val | Glu | Tyr | Cys | Lys | Asn | Lys | Ile | Glu |
| | | 245 | | | | | 250 | | | | | | 255 | | |
| Lys | Met | Lys | Leu | Ile | Phe | Ser | Leu | Gly | Leu | Val | Gly | Gly | Ile | Ser | Phe |
| | 260 | | | | | 265 | | | | | | 270 | | | |
| His | Val | His | Ala | Thr | Gly | Thr | Leu | Ser | Lys | Thr | Leu | Met | Ser | Gln | Leu |
| | 275 | | | | | 280 | | | | | 285 | | | | |
| Ala | Trp | Lys | Lys | Ala | Val | Cys | Tyr | Pro | Leu | Met | Asp | Val | Asn | Pro | His |

290 295 300
 Met Asn Leu Val Ile Trp Ala Ala Ser Val Glu Ile Thr Ser Val Asp
 305 310 315 320
 Ala Val Phe Gln Pro Ala Ile Pro Lys Glu Phe Arg Tyr Tyr Pro Asn
 325 330 335
 Val Val Ala Lys Ser Ile Gly Lys Ile Arg Arg Ile
 340 345

<210> 411

<211> 181

<212> PRT

<213> Human parainfluenza virus 1 strain Washington/1964

<220>

<223> Y1 protein of Human parainfluenza 1 virus

<400> 411

Met Ser Ser Asp Ser Leu Thr Ser Ser Tyr Pro Thr Ser Pro Gln Lys
 1 5 10 15
 Leu Glu Lys Thr Glu Ala Gly Ser Met Val Ser Ser Thr Thr Gln Lys
 20 25 30
 Lys Thr Ser His His Ala Lys Pro Thr Ile Thr Thr Lys Thr Glu Gln
 35 40 45
 Ser Gln Arg Arg Pro Lys Ile Ile Asp Gln Val Arg Gly Val Glu Ser
 50 55 60
 Leu Gly Glu Gln Val Ser Gln Lys Gln Arg His Met Leu Glu Ser Leu
 65 70 75 80
 Ile Asn Lys Val Tyr Thr Gly Pro Leu Gly Glu Glu Leu Val Gln Thr
 85 90 95
 Leu Tyr Leu Arg Ile Trp Ala Met Lys Glu Thr Pro Glu Ser Thr Lys
 100 105 110
 Ile Leu Gln Met Arg Glu Asp Ile Arg Asp Gln Tyr Leu Arg Met Lys
 115 120 125
 Thr Glu Arg Trp Leu Arg Thr Leu Ile Arg Gly Lys Lys Thr Lys Leu
 130 135 140
 Arg Asp Phe Gln Lys Arg Tyr Glu Glu Val His Pro Tyr Leu Met Met
 145 150 155 160
 Glu Arg Val Glu Gln Ile Ile Met Glu Glu Ala Trp Lys Leu Ala Ala
 165 170 175
 His Ile Val Gln Glu
 180

<210> 412

<211> 204

<212> PRT

<213> Human parainfluenza virus 1 strain Washington/1964

<220>

<223> C protein of Human parainfluenza 1 virus

<400> 412

Met Pro Ser Phe Leu Arg Gly Ile Leu Lys Pro Lys Glu Arg His His
 1 5 10 15
 Glu Asn Lys Asn His Ser Gln Met Ser Ser Asp Ser Leu Thr Ser Ser
 20 25 30
 Tyr Pro Thr Ser Pro Gln Lys Leu Glu Lys Thr Glu Ala Gly Ser Met
 35 40 45
 Val Ser Ser Thr Thr Gln Lys Lys Thr Ser His His Ala Lys Pro Thr
 50 55 60
 Ile Thr Thr Lys Thr Glu Gln Ser Gln Arg Arg Pro Lys Ile Ile Asp
 65 70 75 80

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Gln | Val | Arg | Gly | Val | Glu | Ser | Leu | Gly | Glu | Gln | Val | Ser | Gln | Lys | Gln | |
| | | | 85 | | | | | | 90 | | | | | 95 | | |
| Arg | His | Met | Leu | Glu | Ser | Leu | Ile | Asn | Lys | Val | Tyr | Thr | Gly | Pro | Leu | |
| | | | 100 | | | | | 105 | | | | | 110 | | | |
| Gly | Glu | Glu | Leu | Val | Gln | Thr | Leu | Tyr | Leu | Arg | Ile | Trp | Ala | Met | Lys | |
| | | | 115 | | | | 120 | | | | | 125 | | | | |
| Glu | Thr | Pro | Glu | Ser | Thr | Lys | Ile | Leu | Gln | Met | Arg | Glu | Asp | Ile | Arg | |
| | | | 130 | | | 135 | | | | | 140 | | | | | |
| Asp | Gln | Tyr | Leu | Arg | Met | Lys | Thr | Glu | Arg | Trp | Leu | Arg | Thr | Leu | Ile | |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 | |
| Arg | Gly | Lys | Lys | Thr | Lys | Leu | Arg | Asp | Phe | Gln | Lys | Arg | Tyr | Glu | Glu | |
| | | | | 165 | | | | | 170 | | | | | 175 | | |
| Val | His | Pro | Tyr | Leu | Met | Met | Glu | Arg | Val | Glu | Gln | Ile | Ile | Met | Glu | |
| | | | 180 | | | | | 185 | | | | | 190 | | | |
| Glu | Ala | Trp | Lys | Leu | Ala | Ala | His | Ile | Val | Gln | Glu | | | | | |
| | | | 195 | | | | 200 | | | | | | | | | |

<210> 413

<211> 568

<212> PRT

<213> Human parainfluenza virus 1 strain Washington/1964

<220>

<223> phosphoprotein of Human parainfluenza 1 virus

<400> 413

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Met | Asp | Gln | Asp | Ala | Phe | Phe | Phe | Glu | Arg | Asp | Pro | Glu | Ala | Glu | Gly | |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | | |
| Glu | Ala | Pro | Arg | Lys | Gln | Glu | Ser | Leu | Ser | Asp | Val | Ile | Gly | Leu | Leu | |
| | | | 20 | | | | | 25 | | | | | 30 | | | |
| Asp | Val | Val | Leu | Ser | Tyr | Lys | Pro | Thr | Glu | Ile | Gly | Glu | Asp | Arg | Ser | |
| | | 35 | | | | 40 | | | | | | 45 | | | | |
| Trp | Leu | His | Gly | Ile | Ile | Asp | Asn | Pro | Lys | Glu | Asn | Lys | Pro | Ser | Cys | |
| 50 | | | | | 55 | | | | | | 60 | | | | | |
| Lys | Ala | Asp | Asp | Asn | Asn | Lys | Asp | Arg | Ala | Ile | Ser | Thr | Ser | Thr | Gln | |
| 65 | | | | 70 | | | | | | 75 | | | | | 80 | |
| Asp | His | Arg | Ser | Ser | Glu | Gly | Ser | Gly | Ile | Ser | Arg | Arg | Thr | Ser | Glu | |
| | | | | 85 | | | | | 90 | | | | | 95 | | |
| Ser | Lys | Thr | Glu | Thr | His | Ala | Arg | Ile | Leu | Asp | Gln | Gln | Gly | Ile | His | |
| | | | 100 | | | | | 105 | | | | | 110 | | | |
| Arg | Ala | Ser | Arg | Arg | Gly | Thr | Ser | Pro | Asn | Pro | Leu | Pro | Glu | Asn | Met | |
| | | | 115 | | | | 120 | | | | | | 125 | | | |
| Gly | Asn | Glu | Arg | Asn | Thr | Arg | Ile | Asp | Glu | Asp | Ser | Pro | Asn | Glu | Arg | |
| 130 | | | | | 135 | | | | | | 140 | | | | | |
| Arg | His | Gln | Arg | Ser | Val | Leu | Thr | Asp | Glu | Asp | Arg | Lys | Met | Ala | Glu | |
| 145 | | | | 150 | | | | | | 155 | | | | | 160 | |
| Asn | Ser | Asn | Lys | Arg | Glu | Glu | Asp | Gln | Val | Glu | Gly | Phe | Pro | Glu | Glu | |
| | | | | 165 | | | | | 170 | | | | | 175 | | |
| Val | Arg | Arg | Ser | Thr | Pro | Leu | Ser | Asp | Asp | Gly | Glu | Gly | Arg | Thr | Asn | |
| | | | 180 | | | | | 185 | | | | | 190 | | | |
| Asn | Asn | Gly | Arg | Ser | Met | Glu | Thr | Ser | Ser | Thr | His | Ser | Thr | Arg | Ile | |
| | | 195 | | | | | 200 | | | | | 205 | | | | |
| Thr | Asp | Val | Ile | Thr | Asn | Pro | Ser | Pro | Glu | Leu | Glu | Asp | Ala | Val | Leu | |
| | 210 | | | | 215 | | | | | | 220 | | | | | |
| Gln | Arg | Asn | Lys | Arg | Arg | Pro | Thr | Thr | Ile | Lys | Arg | Asn | Gln | Thr | Arg | |
| 225 | | | | 230 | | | | | | 235 | | | | | 240 | |
| Ser | Glu | Arg | Thr | Gln | Ser | Ser | Glu | Leu | His | Lys | Ser | Thr | Ser | Glu | Asn | |
| | | | | 245 | | | | | 250 | | | | | 255 | | |
| Ser | Ser | Asn | Leu | Glu | Asp | His | Asn | Thr | Lys | Thr | Ser | Pro | Lys | Val | Pro | |
| | | | 260 | | | | | 265 | | | | | 270 | | | |
| Pro | Ser | Lys | Asn | Glu | Glu | Ser | Ala | Ala | Thr | Pro | Lys | Asn | Asn | His | Asn | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Thr | Lys | Thr | Asp | Gly | Phe | Ile | Val | Lys | Thr | Arg | Asp | Met | Glu | Tyr | Glu |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Arg | Thr | Thr | Glu | Trp | Leu | Phe | Gly | Pro | Met | Ile | Asn | Lys | Asn | Pro | Leu |
| | 130 | | | | 135 | | | | | | 140 | | | | |
| Phe | Gln | Gly | Gln | Arg | Glu | Asn | Ala | Asp | Leu | Glu | Ala | Leu | Leu | Gln | Thr |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Tyr | Gly | Tyr | Pro | Ala | Cys | Leu | Gly | Ala | Ile | Ile | Val | Gln | Val | Trp | Ile |
| | | | | 165 | | | | | 170 | | | | | 175 | |
| Val | Leu | Val | Lys | Ala | Ile | Thr | Ser | Ser | Ala | Gly | Leu | Arg | Lys | Gly | Phe |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Phe | Asn | Arg | Leu | Glu | Ala | Phe | Arg | Gln | Asp | Gly | Thr | Val | Lys | Ser | Ala |
| | | 195 | | | | | 200 | | | | | 205 | | | |
| Leu | Val | Phe | Thr | Gly | Asp | Thr | Val | Glu | Gly | Ile | Gly | Ala | Val | Met | Arg |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Ser | Gln | Gln | Ser | Leu | Val | Ser | Leu | Met | Val | Glu | Thr | Leu | Val | Thr | Met |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 |
| Asn | Thr | Ser | Arg | Ser | Asp | Leu | Thr | Thr | Leu | Glu | Lys | Asn | Ile | Gln | Ile |
| | | | | 245 | | | | | 250 | | | | | 255 | |
| Val | Gly | Asn | Tyr | Ile | Arg | Asp | Ala | Gly | Leu | Ala | Ser | Phe | Met | Asn | Thr |
| | | 260 | | | | | | 265 | | | | | 270 | | |
| Ile | Lys | Tyr | Gly | Val | Glu | Thr | Lys | Met | Ala | Ala | Leu | Thr | Leu | Ser | Asn |
| | | 275 | | | | | 280 | | | | | 285 | | | |
| Leu | Arg | Pro | Asp | Ile | Asn | Lys | Leu | Arg | Ser | Leu | Val | Asp | Ile | Tyr | Leu |
| | 290 | | | | | 295 | | | | | 300 | | | | |
| Ser | Lys | Gly | Ala | Arg | Ala | Pro | Phe | Ile | Cys | Ile | Leu | Arg | Asp | Pro | Val |
| 305 | | | | | 310 | | | | | 315 | | | | | 320 |
| His | Gly | Asp | Phe | Ala | Pro | Gly | Asn | Tyr | Pro | Ala | Leu | Trp | Ser | Tyr | Ala |
| | | | | 325 | | | | | 330 | | | | | 335 | |
| Met | Gly | Val | Ala | Val | Val | Gln | Asn | Lys | Ala | Met | Gln | Gln | Tyr | Val | Thr |
| | | | 340 | | | | | 345 | | | | | 350 | | |
| Gly | Arg | Thr | Tyr | Leu | Asp | Met | Glu | Met | Phe | Leu | Leu | Gly | Gln | Ala | Val |
| | | 355 | | | | 360 | | | | | | 365 | | | |
| Ala | Lys | Asp | Ala | Asp | Ser | Lys | Ile | Ser | Ser | Ala | Leu | Glu | Glu | Glu | Leu |
| | 370 | | | | | 375 | | | | | 380 | | | | |
| Gly | Val | Thr | Asp | Thr | Ala | Lys | Glu | Arg | Leu | Arg | His | His | Leu | Thr | Asn |
| 385 | | | | | 390 | | | | | 395 | | | | | 400 |
| Leu | Ser | Gly | Gly | Asp | Gly | Ala | Tyr | His | Lys | Pro | Thr | Gly | Gly | Gly | Ala |
| | | | | 405 | | | | | 410 | | | | | 415 | |
| Ile | Glu | Val | Ala | Ile | Asp | His | Thr | Asp | Ile | Thr | Phe | Gly | Val | Glu | Asp |
| | | | 420 | | | | | 425 | | | | | 430 | | |
| Thr | Ala | Asp | Arg | Asp | Asn | Lys | Asn | Trp | Thr | Asn | Asp | Ser | Asn | Glu | Arg |
| | | 435 | | | | | 440 | | | | | 445 | | | |
| Trp | Met | Asn | His | Ser | Ile | Ser | Asn | His | Thr | Ile | Thr | Ile | Arg | Gly | Ala |
| | 450 | | | | | 455 | | | | | 460 | | | | |
| Glu | Glu | Leu | Glu | Glu | Glu | Thr | Asn | Asp | Glu | Asp | Ile | Thr | Asp | Ile | Glu |
| 465 | | | | | 470 | | | | | 475 | | | | | 480 |
| Asn | Lys | Ile | Ala | Arg | Arg | Leu | Ala | Asp | Arg | Lys | Gln | Arg | Leu | Ser | Gln |
| | | | | 485 | | | | | 490 | | | | | 495 | |
| Ala | Asn | Asn | Lys | Arg | Asp | Thr | Ser | Ser | Asp | Ala | Asp | Tyr | Glu | Asn | Asp |
| | | | 500 | | | | | 505 | | | | | 510 | | |
| Asp | Asp | Ala | Thr | Ala | Ala | Ala | Gly | Ile | Gly | Gly | Ile | | | | |
| | | 515 | | | | | 520 | | | | | | | | |

<210> 415

<211> 555

<212> PRT

<213> Human parainfluenza virus 1 strain Washington/1964

<220>

<223> F glycoprotein of Human parainfluenza 1 virus

<400> 415

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Gln | Lys | Ser | Glu | Ile | Leu | Phe | Leu | Val | Tyr | Ser | Ser | Leu | Leu | Leu |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Ser | Ser | Ser | Leu | Cys | Gln | Ile | Pro | Val | Glu | Lys | Leu | Ser | Asn | Val | Gly |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Val | Ile | Ile | Asn | Glu | Gly | Lys | Leu | Leu | Lys | Ile | Ala | Gly | Ser | Tyr | Glu |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Ser | Arg | Tyr | Ile | Val | Leu | Ser | Leu | Val | Pro | Ser | Ile | Asp | Leu | Gln | Asp |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Gly | Cys | Gly | Thr | Thr | Gln | Ile | Ile | Gln | Tyr | Lys | Asn | Leu | Leu | Asn | Arg |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Leu | Leu | Ile | Pro | Leu | Lys | Asp | Ala | Leu | Asp | Leu | Gln | Glu | Ser | Leu | Ile |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Thr | Ile | Thr | Asn | Asp | Thr | Thr | Val | Thr | Asn | Asp | Asn | Pro | Gln | Thr | Arg |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Phe | Phe | Gly | Ala | Val | Ile | Gly | Thr | Ile | Ala | Leu | Gly | Val | Ala | Thr | Ala |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Ala | Gln | Ile | Thr | Ala | Gly | Ile | Ala | Leu | Ala | Glu | Ala | Arg | Glu | Ala | Arg |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Lys | Asp | Ile | Ala | Leu | Ile | Lys | Asp | Ser | Ile | Val | Lys | Thr | His | Asn | Ser |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Val | Glu | Leu | Ile | Gln | Arg | Gly | Ile | Gly | Glu | Gln | Ile | Ile | Ala | Leu | Lys |
| | | | | 165 | | | | | 170 | | | | | 175 | |
| Thr | Leu | Gln | Asp | Phe | Val | Asn | Asp | Glu | Ile | Arg | Pro | Ala | Ile | Gly | Glu |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Leu | Arg | Cys | Glu | Thr | Thr | Ala | Leu | Lys | Leu | Gly | Ile | Lys | Leu | Thr | Gln |
| | | 195 | | | | | 200 | | | | | 205 | | | |
| His | Tyr | Ser | Glu | Leu | Ala | Thr | Ala | Phe | Ser | Ser | Asn | Leu | Gly | Thr | Ile |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Gly | Glu | Lys | Ser | Leu | Thr | Leu | Gln | Ala | Leu | Ser | Ser | Leu | Tyr | Ser | Ala |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 |
| Asn | Ile | Thr | Glu | Ile | Leu | Ser | Thr | Thr | Lys | Lys | Asp | Lys | Ser | Asp | Ile |
| | | | | 245 | | | | | 250 | | | | | 255 | |
| Tyr | Asp | Ile | Ile | Tyr | Thr | Glu | Gln | Val | Lys | Gly | Thr | Val | Ile | Asp | Val |
| | | 260 | | | | | | 265 | | | | | 270 | | |
| Asp | Leu | Glu | Lys | Tyr | Met | Val | Thr | Leu | Leu | Val | Lys | Ile | Pro | Ile | Leu |
| | | 275 | | | | | 280 | | | | | 285 | | | |
| Ser | Glu | Ile | Pro | Gly | Val | Leu | Ile | Tyr | Arg | Ala | Ser | Ser | Ile | Ser | Tyr |
| | 290 | | | | | 295 | | | | | 300 | | | | |
| Asn | Ile | Glu | Gly | Glu | Glu | Trp | His | Val | Ala | Ile | Pro | Asn | Tyr | Ile | Ile |
| 305 | | | | | 310 | | | | | 315 | | | | | 320 |
| Asn | Lys | Ala | Ser | Ser | Leu | Gly | Gly | Ala | Asp | Val | Thr | Asn | Cys | Ile | Glu |
| | | | 325 | | | | | | 330 | | | | 335 | | |
| Ser | Lys | Leu | Ala | Tyr | Ile | Cys | Pro | Arg | Asp | Pro | Thr | Gln | Leu | Ile | Pro |
| | | | 340 | | | | | 345 | | | | | 350 | | |
| Asp | Asn | Gln | Lys | Cys | Ile | Leu | Gly | Asp | Val | Ser | Lys | Cys | Pro | Val | |
| | | 355 | | | | 360 | | | | | | 365 | | | |
| Thr | Lys | Val | Ile | Asn | Asn | Leu | Val | Pro | Lys | Phe | Ala | Phe | Ile | Asn | Gly |
| | 370 | | | | | 375 | | | | | 380 | | | | |
| Gly | Val | Val | Ala | Asn | Cys | Ile | Ala | Ser | Thr | Cys | Thr | Cys | Gly | Thr | Asn |
| 385 | | | | | 390 | | | | | 395 | | | | | 400 |
| Arg | Ile | Pro | Val | Asn | Gln | Asp | Arg | Ser | Arg | Gly | Val | Thr | Phe | Leu | Thr |
| | | | | 405 | | | | | 410 | | | | | 415 | |
| Tyr | Thr | Asn | Cys | Gly | Leu | Ile | Gly | Ile | Asn | Gly | Ile | Glu | Leu | Tyr | Ala |
| | | 420 | | | | | | 425 | | | | | 430 | | |
| Asn | Lys | Arg | Gly | Arg | Asp | Thr | Thr | Trp | Gly | Asn | Gln | Ile | Ile | Lys | Val |
| | | 435 | | | | | 440 | | | | | 445 | | | |
| Gly | Pro | Ala | Val | Ser | Ile | Arg | Pro | Val | Asp | Ile | Ser | Leu | Asn | Leu | Ala |
| | 450 | | | | | 455 | | | | | 460 | | | | |
| Ser | Ala | Thr | Asn | Phe | Leu | Glu | Glu | Ser | Lys | Thr | Glu | Leu | Met | Lys | Ala |
| 465 | | | | | 470 | | | | | 475 | | | | | 480 |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Arg | Ala | Ile | Ile | Ser | Ala | Val | Gly | Gly | Trp | His | Asn | Thr | Glu | Ser | Thr |
| | | | | 485 | | | | | 490 | | | | | 495 | |
| Gln | Ile | Ile | Met | Ile | Ile | Ile | Val | Cys | Ile | Leu | Ile | Ile | Ile | Ile | Cys |
| | | | 500 | | | | | 505 | | | | | 510 | | |
| Gly | Ile | Leu | Tyr | Tyr | Leu | Tyr | Arg | Val | Arg | Arg | Leu | Leu | Val | Met | Ile |
| | | 515 | | | | | 520 | | | | | 525 | | | |
| Asn | Ser | Thr | His | Asn | Ser | Pro | Val | Asn | Ala | Tyr | Thr | Leu | Glu | Ser | Arg |
| | 530 | | | | | 535 | | | | | 540 | | | | |
| Met | Arg | Asn | Pro | Tyr | Met | Gly | Asn | Asn | Ser | Asn | | | | | |
| 545 | | | | | 550 | | | | | 555 | | | | | |

<210> 416

<211> 373

<212> PRT

<213> Human parainfluenza virus 3

<220>

<223> D protein of Human parainfluenza virus 3

<400> 416

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Glu | Ser | Asp | Ala | Lys | Asn | Tyr | Gln | Ile | Met | Asp | Ser | Trp | Glu | Glu |
| 1 | | | | 5 | | | | 10 | | | | | | 15 | |
| Glu | Ser | Arg | Asp | Lys | Ser | Thr | Asn | Ile | Ser | Ser | Ala | Leu | Asn | Ile | Ile |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Glu | Phe | Ile | Leu | Ser | Thr | Asp | Pro | Gln | Glu | Asp | Leu | Ser | Glu | Asn | Asp |
| | 35 | | | | | 40 | | | | | 45 | | | | |
| Thr | Ile | Asn | Thr | Arg | Thr | Gln | Gln | Leu | Ser | Ala | Thr | Ile | Tyr | Gln | Pro |
| | 50 | | | | 55 | | | | | 60 | | | | | |
| Lys | Ile | Lys | Pro | Thr | Glu | Thr | Ser | Glu | Lys | Asp | Ser | Gly | Ser | Thr | Asp |
| 65 | | | | 70 | | | | | 75 | | | | | 80 | |
| Lys | Asn | Arg | Gln | Ser | Gly | Ser | Ser | His | Glu | Cys | Thr | Thr | Glu | Ala | Lys |
| | | | 85 | | | | | 90 | | | | | | 95 | |
| Asp | Arg | Thr | Ile | Asp | Gln | Glu | Thr | Val | Gln | Arg | Gly | Pro | Gly | Arg | Arg |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Ser | Ser | Ser | Asp | Ser | Arg | Ala | Glu | Thr | Val | Val | Ser | Gly | Gly | Ile | Ser |
| | 115 | | | | | 120 | | | | | | 125 | | | |
| Arg | Ser | Ile | Thr | Asn | Ser | Lys | Asn | Gly | Thr | Gln | Asn | Thr | Glu | Asp | Ile |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Asp | Leu | Asn | Glu | Ile | Arg | Lys | Met | Asp | Lys | Asp | Ser | Ile | Glu | Gly | Lys |
| 145 | | | | 150 | | | | | 155 | | | | | | 160 |
| Val | Arg | Gln | Ser | Ala | Asp | Val | Pro | Ser | Glu | Ile | Ser | Gly | Ser | Asp | Val |
| | | | | 165 | | | | | 170 | | | | | 175 | |
| Ile | Phe | Thr | Thr | Glu | Gln | Ser | Arg | Asn | Ser | Asp | His | Gly | Arg | Ser | Leu |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Glu | Ser | Ile | Ser | Thr | Pro | Asp | Thr | Arg | Ser | Ile | Ser | Val | Val | Thr | Ala |
| | 195 | | | | | 200 | | | | | | 205 | | | |
| Ala | Thr | Pro | Asp | Asp | Glu | Glu | Ile | Leu | Met | Lys | Asn | Ser | Arg | Thr | |
| | 210 | | | | | 215 | | | | 220 | | | | | |
| Lys | Lys | Ser | Ser | Ser | Ile | His | Gln | Glu | Asp | Asp | Lys | Arg | Ile | Lys | Lys |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 |
| Gly | Gly | Glu | Lys | Gly | Lys | Thr | Gly | Leu | Arg | Asn | Gln | Lys | Ile | Leu | Thr |
| | | | | 245 | | | | | 250 | | | | | 255 | |
| Thr | Arg | Tyr | Gln | His | Gln | Thr | Thr | Asp | Pro | His | Gln | Lys | Gly | Arg | Arg |
| | | | 260 | | | | | 265 | | | | | 270 | | |
| Lys | Ser | Gln | Lys | Gln | Gln | Pro | Ser | Thr | Pro | Thr | Gln | Arg | Gly | Lys | Gln |
| | 275 | | | | | | 280 | | | | | 285 | | | |
| Lys | Tyr | Arg | Gln | Asn | His | Gln | Glu | His | Asn | Pro | His | His | Gly | Ile | Ser |
| | 290 | | | | | 295 | | | | | 300 | | | | |
| Pro | Leu | Ile | Thr | Thr | Gln | Ile | Glu | Pro | Asn | Arg | Gln | Thr | Gln | Leu | Pro |
| 305 | | | | | 310 | | | | | 315 | | | | | 320 |
| Gln | Gln | Gln | Pro | Pro | Asp | Gln | Leu | Ile | Gln | Lys | Asn | Gln | Ser | Glu | Gln |

325 330 335
 Thr Leu Asp Pro Asn Pro Arg His Lys Arg Gln Met Glu Arg Lys Gly
 340 345 350
 Arg Ile Gln Lys Arg Ala Ile Asp Leu Gln Arg Gly Gln Leu Leu Tyr
 355 360 365
 Cys Arg Ile Leu Val
 370

 <210> 417
 <211> 574
 <212> PRT
 <213> Human parainfluenza virus 3

 <220>
 <223> hemagglutinin-neuraminidase of Human parainfluenza virus 3

 <400> 417
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 Leu Glu Thr Ser Met Ala Thr His Asn Asn Lys Leu Thr Asn Lys Ile
 20 25 30
 Ile Tyr Ile Leu Trp Thr Ile Ile Leu Val Leu Leu Ser Ile Val Phe
 35 40 45
 Ile Ile Val Leu Ile Asn Ser Ile Asn Ser Glu Lys Val His Asn Ser
 50 55 60
 Leu Leu Gln Glu Ile Asn Asn Glu Phe Met Glu Ile Thr Glu Lys Ile
 65 70 75 80
 Gln Met Ala Ser Asp Asn Thr Asn Asp Leu Ile Gln Ser Gly Val Asn
 85 90 95
 Thr Arg Leu Leu Thr Ile Gln Ser His Val Gln Asn Tyr Ile Pro Ile
 100 105 110
 Ser Leu Thr Gln Gln Met Ser Asp Leu Arg Lys Phe Ile Ser Glu Ile
 115 120 125
 Thr Ile Arg Asn Asp Asn Gln Glu Val Pro Gln Gln Arg Ile Thr His
 130 135 140
 Asp Val Gly Ile Lys Pro Leu Asn Pro Asp Asp Phe Trp Arg Cys Thr
 145 150 155 160
 Ser Gly Leu Pro Phe Leu Met Arg Asn Pro Lys Ile Arg Leu Met Pro
 165 170 175
 Gly Pro Gly Leu Leu Ala Met Pro Thr Thr Val Asp Gly Cys Val Arg
 180 185 190
 Thr Pro Ser Leu Ile Ile Asn Asp Leu Ile Tyr Ala Tyr Thr Ser Asn
 195 200 205
 Leu Ile Thr Arg Gly Cys Gln Asp Ile Gly Lys Ser Tyr Gln Val Leu
 210 215 220
 Gln Val Gly Ile Ile Thr Val Asn Ser Asp Leu Val Pro Asp Leu Asn
 225 230 235 240
 Pro Arg Phe Ser His Thr Phe Asn Ile Asn Asp Asn Arg Lys Ser Cys
 245 250 255
 Ser Leu Ala Leu Leu Asn Thr Asp Val Tyr Gln Leu Cys Ser Thr Pro
 260 265 270
 Lys Val Asp Glu Arg Ser Asp Tyr Ala Ser Ser Gly Ile Glu Asp Ile
 275 280 285
 Val Leu Asp Ile Val Asn Tyr Asp Gly Ser Ile Ser Thr Thr Arg Phe
 290 295 300
 Lys Asn Asn Asn Ile Ser Phe Asp Gln Pro Tyr Ala Ala Leu Tyr Pro
 305 310 315 320
 Ser Val Gly Pro Gly Ile Tyr Tyr Lys Gly Lys Ile Ile Phe Leu Gly
 325 330 335
 Tyr Gly Gly Leu Glu His Pro Ile Asn Glu Asn Val Ile Cys Asn Thr
 340 345 350

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Thr | Glu | Cys | Pro | Gly | Lys | Thr | Gln | Arg | Asp | Cys | Asn | Gln | Ala | Ser | Tyr |
| | | 355 | | | | | 360 | | | | | 365 | | | |
| Ser | Pro | Trp | Phe | Ser | Asp | Arg | Arg | Met | Val | Asn | Ser | Ile | Ile | Val | Val |
| | 370 | | | | | 375 | | | | 380 | | | | | |
| Asp | Lys | Gly | Leu | Asn | Ser | Ile | Pro | Lys | Leu | Lys | Val | Trp | Thr | Ile | Ser |
| 385 | | | | | 390 | | | | | 395 | | | | | 400 |
| Met | Arg | Gln | Asn | Tyr | Trp | Gly | Ser | Glu | Gly | Arg | Leu | Ile | Leu | Leu | Gly |
| | | | 405 | | | | | | 410 | | | | | | 415 |
| Asn | Lys | Ile | Tyr | Ile | Tyr | Thr | Arg | Ser | Thr | Ser | Trp | His | Ser | Lys | Leu |
| | | | 420 | | | | | 425 | | | | | 430 | | |
| Gln | Leu | Gly | Ile | Ile | Asp | Ile | Thr | Asp | Tyr | Ser | Asp | Ile | Arg | Ile | Lys |
| | 435 | | | | | | 440 | | | | | 445 | | | |
| Trp | Thr | Trp | His | Asn | Val | Leu | Ser | Arg | Pro | Gly | Asn | Asp | Glu | Cys | Pro |
| | 450 | | | | | 455 | | | | | 460 | | | | |
| Trp | Gly | His | Ser | Cys | Pro | Asn | Gly | Cys | Ile | Thr | Gly | Val | Tyr | Thr | Asp |
| 465 | | | | | 470 | | | | | | 475 | | | | 480 |
| Ala | Tyr | Pro | Leu | Asn | Pro | Thr | Gly | Ser | Ile | Val | Ser | Ser | Val | Ile | Leu |
| | | | | 485 | | | | | 490 | | | | | | 495 |
| Asp | Ser | Gln | Lys | Ser | Arg | Val | Asn | Pro | Val | Ile | Thr | Tyr | Ser | Thr | Ala |
| | | | 500 | | | | | 505 | | | | | 510 | | |
| Thr | Glu | Arg | Val | Asn | Glu | Leu | Ala | Ile | Arg | Asn | Arg | Thr | Leu | Ser | Ala |
| | 515 | | | | | | 520 | | | | | 525 | | | |
| Gly | Tyr | Thr | Thr | Thr | Ser | Cys | Ile | Thr | His | Tyr | Asp | Lys | Gly | Tyr | Cys |
| | 530 | | | | | 535 | | | | | 540 | | | | |
| Phe | His | Ile | Val | Glu | Ile | Asn | Gln | Lys | Ser | Ser | Asn | Thr | Phe | Gln | Pro |
| 545 | | | | | 550 | | | | | 555 | | | | | 560 |
| Met | Leu | Phe | Lys | Thr | Glu | Ile | Pro | Lys | Ser | Cys | Ser | Gln | Ser | | |
| | | | | 565 | | | | | 570 | | | | | | |

<210> 418

<211> 515

<212> PRT

<213> Human parainfluenza virus 3

<220>

<223> nucleocapsid protein of Human parainfluenza virus 3

<400> 418

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Leu | Ser | Leu | Phe | Asp | Thr | Phe | Asn | Ala | Arg | Arg | Gln | Glu | Asn | Ile |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Thr | Lys | Ser | Ala | Gly | Gly | Ala | Ile | Ile | Pro | Gly | Gln | Lys | Asn | Thr | Val |
| | | | 20 | | | | 25 | | | | | | 30 | | |
| Ser | Ile | Phe | Ala | Leu | Gly | Pro | Thr | Ile | Thr | Asp | Asp | Asn | Glu | Lys | Met |
| | 35 | | | | | 40 | | | | | | 45 | | | |
| Thr | Leu | Ala | Leu | Leu | Phe | Leu | Ser | His | Ser | Leu | Asp | Asn | Glu | Lys | Gln |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| His | Ala | Gln | Arg | Ala | Gly | Phe | Leu | Val | Ser | Leu | Leu | Ser | Met | Ala | Tyr |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Ala | Asn | Pro | Glu | Leu | Tyr | Leu | Thr | Thr | Asn | Gly | Ser | Asn | Ala | Asp | Val |
| | | | 85 | | | | | | 90 | | | | | 95 | |
| Lys | Tyr | Val | Ile | Tyr | Met | Ile | Glu | Lys | Asp | Leu | Lys | Arg | Gln | Lys | Tyr |
| | | 100 | | | | | 105 | | | | | | 110 | | |
| Gly | Gly | Phe | Val | Val | Lys | Thr | Arg | Glu | Met | Val | Tyr | Asp | Lys | Thr | Thr |
| | 115 | | | | | 120 | | | | | | 125 | | | |
| Asp | Trp | Ile | Phe | Gly | Ser | Asp | Leu | Asp | Cys | Asp | Gln | Glu | Thr | Met | Leu |
| | 130 | | | | 135 | | | | | | 140 | | | | |
| Gln | Asn | Gly | Arg | Asn | Asn | Ser | Thr | Ile | Glu | Asp | Leu | Val | His | Thr | Phe |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Gly | Tyr | Pro | Ser | Cys | Leu | Gly | Ala | Leu | Ile | Ile | Gln | Ile | Trp | Ile | Val |
| | | | | 165 | | | | | 170 | | | | | 175 | |

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Leu | Val | Lys | Ala | Ile | Thr | Ser | Ile | Ser | Gly | Leu | Arg | Lys | Gly | Phe | Phe | |
| | | | 180 | | | | | 185 | | | | | 190 | | | |
| Thr | Arg | Leu | Glu | Ala | Phe | Arg | Gln | Asp | Gly | Thr | Val | Gln | Ala | Gly | Leu | |
| | | 195 | | | | | 200 | | | | | 205 | | | | |
| Val | Leu | Ser | Gly | Asp | Thr | Val | Asp | Gln | Ile | Gly | Ser | Ile | Met | Arg | Ser | |
| | 210 | | | | | 215 | | | | | 220 | | | | | |
| Gln | Gln | Ser | Leu | Val | Thr | Leu | Met | Val | Glu | Thr | Leu | Ile | Thr | Met | Asn | |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 | |
| Thr | Ser | Arg | Asn | Asp | Leu | Thr | Thr | Ile | Glu | Lys | Asn | Ile | Gln | Ile | Val | |
| | | | 245 | | | | | | 250 | | | | | 255 | | |
| Gly | Asn | Tyr | Ile | Arg | Asp | Ala | Gly | Leu | Ala | Ser | Phe | Phe | Asn | Thr | Ile | |
| | | 260 | | | | | | 265 | | | | | 270 | | | |
| Arg | Tyr | Gly | Ile | Glu | Thr | Arg | Met | Ala | Ala | Leu | Thr | Leu | Ser | Thr | Leu | |
| | 275 | | | | | | 280 | | | | | 285 | | | | |
| Arg | Pro | Asp | Ile | Asn | Arg | Leu | Lys | Ala | Leu | Met | Glu | Leu | Tyr | Leu | Ser | |
| | 290 | | | | | 295 | | | | | 300 | | | | | |
| Lys | Gly | Pro | Arg | Ala | Pro | Phe | Ile | Cys | Ile | Leu | Arg | Asp | Pro | Ile | His | |
| 305 | | | | | 310 | | | | | 315 | | | | | 320 | |
| Gly | Glu | Phe | Ala | Pro | Gly | Asn | Tyr | Pro | Ala | Ile | Trp | Ser | Tyr | Ala | Met | |
| | | | 325 | | | | | | 330 | | | | | 335 | | |
| Gly | Val | Ala | Val | Gln | Asn | Arg | Ala | Met | Gln | Gln | Tyr | Val | Thr | Gly | | |
| | | 340 | | | | | 345 | | | | | 350 | | | | |
| Arg | Ser | Tyr | Leu | Asp | Ile | Asp | Met | Phe | Gln | Leu | Gly | Gln | Ala | Val | Ala | |
| | 355 | | | | | | 360 | | | | | 365 | | | | |
| Arg | Asp | Ala | Glu | Ala | Gln | Met | Ser | Ser | Thr | Leu | Glu | Asp | Glu | Leu | Gly | |
| | 370 | | | | | 375 | | | | | 380 | | | | | |
| Val | Thr | His | Glu | Ala | Lys | Glu | Ser | Leu | Lys | Arg | His | Ile | Arg | Asn | Ile | |
| 385 | | | | | 390 | | | | | 395 | | | | | 400 | |
| Asn | Ser | Ser | Glu | Thr | Ser | Phe | His | Lys | Pro | Thr | Gly | Gly | Ser | Ala | Ile | |
| | | | 405 | | | | | | 410 | | | | | 415 | | |
| Glu | Met | Ala | Ile | Asp | Glu | Glu | Pro | Glu | Gln | Phe | Glu | His | Arg | Ser | Asp | |
| | | 420 | | | | | | 425 | | | | | 430 | | | |
| Gln | Glu | Arg | Asp | Gly | Glu | Pro | Gln | Ser | Ser | Ile | Ile | Gln | Tyr | Ala | Trp | |
| | | 435 | | | | | 440 | | | | | 445 | | | | |
| Ala | Glu | Gly | Asn | Arg | Ser | Asp | Asp | Arg | Thr | Glu | Gln | Asp | Thr | Glu | Ser | |
| | 450 | | | | | 455 | | | | | 460 | | | | | |
| Asp | Asn | Ile | Lys | Thr | Glu | Gln | Gln | Asn | Ile | Arg | Asp | Arg | Leu | Asn | Lys | |
| 465 | | | | | 470 | | | | | 475 | | | | | 480 | |
| Arg | Leu | Asn | Glu | Lys | Lys | Lys | Gln | Gly | Ser | Gln | Pro | Pro | Thr | Asn | Pro | |
| | | | 485 | | | | | | 490 | | | | | 495 | | |
| Thr | Asn | Arg | Thr | Asn | Gln | Asp | Glu | Ile | Asp | Asp | Leu | Phe | Asn | Ala | Phe | |
| | | | 500 | | | | | 505 | | | | | 510 | | | |
| Gly | Ser | Asn | | | | | | | | | | | | | | |
| | | 515 | | | | | | | | | | | | | | |

<210> 419

<211> 395

<212> PRT

<213> Human parainfluenza virus 2

<220>

<223> P protein of Human parainfluenza virus 2

<400> 419

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Met | Ala | Glu | Glu | Pro | Thr | Tyr | Thr | Thr | Glu | Gln | Val | Asp | Glu | Leu | Ile | |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | | |
| His | Ala | Gly | Leu | Gly | Thr | Val | Asp | Phe | Phe | Leu | Ser | Arg | Pro | Ile | Asp | |
| | | 20 | | | | | | 25 | | | | | 30 | | | |
| Ala | Gln | Ser | Ser | Leu | Gly | Lys | Gly | Ser | Ile | Pro | Pro | Gly | Val | Thr | Ala | |
| | | 35 | | | | | 40 | | | | | 45 | | | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Val | Leu | Thr | Ser | Ala | Ala | Glu | Thr | Lys | Ser | Lys | Pro | Val | Ala | Ala | Gly |
| 50 | | | | | | 55 | | | | | 60 | | | | |
| Pro | Val | Lys | Pro | Arg | Arg | Lys | Lys | Val | Ile | Ser | Asn | Thr | Thr | Pro | Tyr |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Thr | Ile | Ala | Asp | Asn | Ile | Pro | Pro | Glu | Lys | Leu | Pro | Ile | Asn | Thr | Pro |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Ile | Pro | Asn | Pro | Leu | Leu | Pro | Leu | Ala | Arg | Pro | His | Gly | Lys | Met | Thr |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Asp | Ile | Asp | Ile | Val | Thr | Gly | Asn | Ile | Thr | Glu | Gly | Ser | Tyr | Lys | Gly |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Val | Glu | Leu | Ala | Lys | Leu | Gly | Lys | Gln | Thr | Leu | Leu | Thr | Arg | Phe | Thr |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Ser | Asn | Glu | Pro | Val | Ser | Ser | Ala | Gly | Ser | Ala | Gln | Asp | Pro | Asn | Phe |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Lys | Arg | Gly | Gly | Glu | Leu | Ile | Glu | Lys | Glu | Gln | Glu | Ala | Thr | Ile | Gly |
| | | | | 165 | | | | | 170 | | | | | 175 | |
| Glu | Asn | Gly | Val | Leu | His | Gly | Ser | Glu | Ile | Arg | Ser | Lys | Ser | Ser | Ser |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Gly | Val | Ile | Pro | Gly | Val | Pro | Gln | Ser | Arg | Pro | Gln | Leu | Ala | Ser | Ser |
| | | 195 | | | | | 200 | | | | | 205 | | | |
| Pro | Ala | His | Ala | Asp | Pro | Ala | Pro | Ala | Ser | Ala | Glu | Asn | Val | Lys | Glu |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Ile | Ile | Glu | Leu | Leu | Lys | Gly | Leu | Asp | Leu | Arg | Leu | Gln | Thr | Val | Glu |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 |
| Gly | Lys | Val | Asp | Lys | Ile | Leu | Ala | Thr | Ser | Ala | Thr | Ile | Ile | Asn | Leu |
| | | | | 245 | | | | | 250 | | | | | 255 | |
| Lys | Asn | Glu | Met | Thr | Ser | Leu | Lys | Ala | Ser | Val | Ala | Thr | Met | Glu | Gly |
| | | | 260 | | | | | 265 | | | | | 270 | | |
| Met | Ile | Thr | Thr | Ile | Lys | Ile | Met | Asp | Pro | Ser | Thr | Pro | Thr | Asn | Val |
| | 275 | | | | | | 280 | | | | | | 285 | | |
| Pro | Val | Glu | Glu | Ile | Arg | Lys | Ser | Leu | His | Asn | Val | Pro | Val | Val | Ile |
| | 290 | | | | | 295 | | | | | 300 | | | | |
| Ala | Gly | Pro | Thr | Ser | Gly | Gly | Phe | Thr | Ala | Glu | Gln | Val | Ile | Leu | Ile |
| 305 | | | | | 310 | | | | | 315 | | | | | 320 |
| Ser | Met | Asp | Glu | Leu | Ala | Arg | Pro | Thr | Leu | Ser | Ser | Thr | Lys | Arg | Ile |
| | | | | 325 | | | | | 330 | | | | | 335 | |
| Thr | Arg | Lys | Pro | Glu | Ser | Lys | Lys | Asp | Leu | Thr | Gly | Ile | Lys | Leu | Thr |
| | | | 340 | | | | | 345 | | | | | 350 | | |
| Leu | Met | Gln | Leu | Ala | Asn | Asp | Cys | Ile | Ser | Arg | Pro | Asp | Thr | Lys | Thr |
| | | 355 | | | | | 360 | | | | | 365 | | | |
| Glu | Phe | Val | Thr | Lys | Ile | Gln | Ala | Ala | Thr | Thr | Glu | Ser | Gln | Leu | Asn |
| | 370 | | | | | 375 | | | | | 380 | | | | |
| Glu | Ile | Lys | Arg | Ser | Ile | Ile | Arg | Ser | Ala | Ile | | | | | |
| 385 | | | | | 390 | | | | | 395 | | | | | |

<210> 420

<211> 539

<212> PRT

<213> Human parainfluenza virus

<220>

<223> F protein of Human parainfluenza virus

<400> 420

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ser | Trp | Lys | Val | Val | Ile | Ile | Phe | Ser | Leu | Leu | Ile | Thr | Pro | Gln |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| His | Gly | Leu | Lys | Glu | Ser | Tyr | Leu | Glu | Glu | Ser | Cys | Ser | Thr | Ile | Thr |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Glu | Gly | Tyr | Leu | Ser | Val | Leu | Arg | Thr | Gly | Trp | Tyr | Thr | Asn | Val | Phe |
| | | 35 | | | | | 40 | | | | | 45 | | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Thr | Leu | Glu | Val | Gly | Asp | Val | Glu | Asn | Leu | Thr | Cys | Ala | Asp | Gly | Pro |
| 50 | | | | | | 55 | | | | | 60 | | | | |
| Ser | Leu | Ile | Lys | Thr | Glu | Leu | Asp | Leu | Thr | Lys | Ser | Ala | Leu | Arg | Glu |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Leu | Arg | Thr | Val | Ser | Ala | Asp | Gln | Leu | Ala | Arg | Glu | Glu | Gln | Ile | Glu |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Asn | Pro | Arg | Gln | Ser | Arg | Phe | Val | Leu | Gly | Ala | Ile | Ala | Leu | Gly | Val |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Ala | Thr | Ala | Ala | Ala | Val | Thr | Ala | Gly | Val | Ala | Ile | Ala | Lys | Thr | Ile |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Arg | Leu | Glu | Ser | Glu | Val | Thr | Ala | Ile | Lys | Asn | Ala | Leu | Lys | Lys | Thr |
| | 130 | | | | | 135 | | | | 140 | | | | | |
| Asn | Glu | Ala | Val | Ser | Thr | Leu | Gly | Asn | Gly | Val | Arg | Val | Leu | Ala | Thr |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Ala | Val | Arg | Glu | Leu | Lys | Asp | Phe | Val | Ser | Lys | Asn | Leu | Thr | Arg | Ala |
| | | | | 165 | | | | | 170 | | | | | 175 | |
| Ile | Asn | Lys | Asn | Lys | Cys | Asp | Ile | Ala | Asp | Leu | Lys | Met | Ala | Val | Ser |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Phe | Ser | Gln | Phe | Asn | Arg | Arg | Phe | Leu | Asn | Val | Val | Arg | Gln | Phe | Ser |
| | 195 | | | | | | 200 | | | | | 205 | | | |
| Asp | Asn | Ala | Gly | Ile | Thr | Pro | Ala | Ile | Ser | Leu | Asp | Leu | Met | Thr | Asp |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Ala | Glu | Leu | Ala | Arg | Ala | Val | Ser | Asn | Met | Pro | Thr | Ser | Ala | Gly | Gln |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 |
| Ile | Lys | Leu | Met | Leu | Glu | Asn | Arg | Ala | Met | Val | Arg | Arg | Lys | Gly | Phe |
| | | | | 245 | | | | | 250 | | | | | 255 | |
| Gly | Phe | Leu | Ile | Gly | Val | Tyr | Gly | Ser | Ser | Val | Ile | Tyr | Met | Val | Gln |
| | | | 260 | | | | 265 | | | | | | 270 | | |
| Leu | Pro | Ile | Phe | Gly | Val | Ile | Asp | Thr | Pro | Cys | Trp | Ile | Val | Lys | Ala |
| | | 275 | | | | | 280 | | | | | 285 | | | |
| Ala | Pro | Ser | Cys | Ser | Gly | Lys | Lys | Gly | Asn | Tyr | Ala | Cys | Leu | Leu | Arg |
| | 290 | | | | | 295 | | | | | 300 | | | | |
| Glu | Asp | Gln | Gly | Trp | Tyr | Cys | Gln | Asn | Ala | Gly | Ser | Thr | Val | Tyr | Tyr |
| 305 | | | | | 310 | | | | | 315 | | | | | 320 |
| Pro | Asn | Glu | Lys | Asp | Cys | Glu | Thr | Arg | Gly | Asp | His | Val | Phe | Cys | Asp |
| | | | | 325 | | | | | 330 | | | | | 335 | |
| Thr | Ala | Ala | Gly | Ile | Asn | Val | Ala | Glu | Gln | Ser | Lys | Glu | Cys | Asn | Ile |
| | | | 340 | | | | | 345 | | | | | 350 | | |
| Asn | Ile | Ser | Thr | Thr | Asn | Tyr | Pro | Cys | Lys | Val | Ser | Thr | Gly | Arg | His |
| | | 355 | | | | 360 | | | | | | 365 | | | |
| Pro | Ile | Ser | Met | Val | Ala | Leu | Ser | Pro | Leu | Gly | Ala | Leu | Val | Ala | Cys |
| | 370 | | | | | 375 | | | | | 380 | | | | |
| Tyr | Lys | Gly | Val | Ser | Cys | Ser | Ile | Gly | Ser | Asn | Arg | Val | Gly | Ile | Ile |
| 385 | | | | | 390 | | | | | 395 | | | | | 400 |
| Lys | Gln | Leu | Asn | Lys | Gly | Cys | Ser | Tyr | Ile | Thr | Asn | Gln | Asp | Ala | Asp |
| | | | | 405 | | | | | 410 | | | | | 415 | |
| Thr | Val | Thr | Ile | Asp | Asn | Thr | Val | Tyr | Gln | Leu | Ser | Lys | Val | Glu | Gly |
| | | | 420 | | | | | 425 | | | | | 430 | | |
| Glu | Gln | His | Val | Ile | Lys | Gly | Arg | Pro | Val | Ser | Ser | Ser | Phe | Asp | Pro |
| | | 435 | | | | | 440 | | | | | 445 | | | |
| Val | Lys | Phe | Pro | Glu | Asp | Gln | Phe | Asn | Val | Ala | Leu | Asp | Gln | Val | Phe |
| | 450 | | | | | 455 | | | | | 460 | | | | |
| Glu | Ser | Ile | Glu | Asn | Ser | Gln | Ala | Leu | Val | Asp | Gln | Ser | Asn | Arg | Ile |
| 465 | | | | | 470 | | | | | 475 | | | | | 480 |
| Leu | Ser | Ser | Ala | Glu | Lys | Gly | Asn | Thr | Gly | Phe | Ile | Ile | Val | Ile | Ile |
| | | | | 485 | | | | | 490 | | | | | 495 | |
| Leu | Ile | Ala | Val | Leu | Gly | Ser | Thr | Met | Ile | Leu | Val | Ser | Val | Phe | Ile |
| | | | 500 | | | | | 505 | | | | | 510 | | |
| Ile | Ile | Lys | Lys | Thr | Lys | Lys | Pro | Thr | Gly | Ala | Pro | Pro | Glu | Leu | Ser |
| | | 515 | | | | | 520 | | | | | 525 | | | |
| Gly | Val | Thr | Asn | Asn | Gly | Phe | Ile | Pro | His | Asn | | | | | |

<210> 421
 <211> 236
 <212> PRT
 <213> Human parainfluenza virus

<220>
 <223> G protein of Human parainfluenza virus

<400> 421
 Met Glu Val Lys Val Glu Asn Ile Arg Thr Ile Asp Met Leu Lys Ala
 1 5 10 15
 Arg Val Lys Asn Arg Val Ala Arg Ser Lys Cys Phe Lys Asn Ala Ser
 20 25 30
 Leu Val Leu Ile Gly Ile Thr Thr Leu Ser Ile Ala Leu Asn Ile Tyr
 35 40 45
 Leu Ile Ile Asn Tyr Lys Met Gln Lys Asn Thr Ser Glu Ser Glu His
 50 55 60
 His Thr Ser Ser Ser Pro Met Glu Ser Ser Arg Glu Thr Pro Thr Val
 65 70 75 80
 Pro Thr Asp Asn Ser Asp Thr Asn Ser Ser Pro Gln His Pro Thr Gln
 85 90 95
 Gln Ser Thr Glu Gly Ser Thr Leu Tyr Phe Ala Ala Ser Ala Ser Ser
 100 105 110
 Pro Glu Thr Glu Pro Thr Ser Thr Pro Asp Thr Thr Asn Arg Pro Pro
 115 120 125
 Phe Val Asp Thr His Thr Thr Pro Pro Ser Ala Ser Arg Thr Lys Thr
 130 135 140
 Ser Pro Ala Val His Thr Lys Asn Asn Pro Arg Thr Ser Ser Arg Thr
 145 150 155 160
 His Ser Pro Pro Arg Ala Thr Thr Arg Thr Ala Arg Arg Thr Thr Thr
 165 170 175
 Leu Arg Thr Ser Ser Thr Arg Lys Arg Pro Ser Thr Ala Ser Val Gln
 180 185 190
 Pro Asp Ile Ser Ala Thr Thr His Lys Asn Glu Glu Ala Ser Pro Ala
 195 200 205
 Ser Pro Gln Thr Ser Ala Ser Thr Thr Arg Ile Gln Arg Lys Ser Val
 210 215 220
 Glu Ala Asn Thr Ser Thr Thr Tyr Asn Gln Thr Ser
 225 230 235

<210> 422
 <211> 120
 <212> PRT
 <213> Homo sapiens

<400> 422
 Gln Val Thr Leu Arg Glu Ser Gly Pro Ala Leu Val Lys Pro Thr Gln
 1 5 10 15
 Thr Leu Thr Leu Thr Cys Thr Phe Ser Gly Phe Ser Leu Ser Thr Ala
 20 25 30
 Gly Met Ser Val Gly Trp Ile Arg Gln Pro Pro Gly Lys Ala Leu Glu
 35 40 45
 Trp Leu Ala Asp Ile Trp Trp Asp Asp Lys Lys His Tyr Asn Pro Ser
 50 55 60
 Leu Lys Asp Arg Leu Thr Ile Ser Lys Asp Thr Ser Lys Asn Gln Val
 65 70 75 80
 Val Leu Lys Val Thr Asn Met Asp Pro Ala Asp Thr Ala Thr Tyr Tyr

| | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| | | | | 85 | | | | | 90 | | | | | 95 | | | |
| Cys | Ala | Arg | Asp | Met | Ile | Phe | Asn | Phe | Tyr | Phe | Asp | Val | Trp | Gly | Gln | | |
| | | | 100 | | | | | 105 | | | | | 110 | | | | |
| Gly | Thr | Thr | Val | Thr | Val | Ser | Ser | | | | | | | | | | |
| | | | 115 | | | | 120 | | | | | | | | | | |

<210> 423
 <211> 106
 <212> PRT
 <213> Homo sapiens

<400> 423

| | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| Asp | Ile | Gln | Met | Thr | Gln | Ser | Pro | Ser | Thr | Leu | Ser | Ala | Ser | Val | Gly | | |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | | | |
| Asp | Arg | Val | Thr | Ile | Thr | Cys | Ser | Ala | Ser | Ser | Arg | Val | Gly | Tyr | Met | | |
| | | | 20 | | | | | 25 | | | | | 30 | | | | |
| His | Trp | Tyr | Gln | Gln | Lys | Pro | Gly | Lys | Ala | Pro | Lys | Leu | Leu | Ile | Tyr | | |
| | | | 35 | | | | 40 | | | | | 45 | | | | | |
| Asp | Thr | Leu | Leu | Leu | Asp | Ser | Gly | Val | Pro | Ser | Arg | Phe | Ser | Gly | Ser | | |
| | 50 | | | | 55 | | | | | 60 | | | | | | | |
| Gly | Ser | Gly | Thr | Glu | Phe | Thr | Leu | Thr | Ile | Ser | Ser | Leu | Gln | Pro | Asp | | |
| 65 | | | | 70 | | | | | 75 | | | | | 80 | | | |
| Asp | Phe | Ala | Thr | Tyr | Tyr | Cys | Phe | Gln | Gly | Ser | Gly | Tyr | Pro | Phe | Thr | | |
| | | | 85 | | | | | 90 | | | | | 95 | | | | |
| Phe | Gly | Gly | Gly | Thr | Lys | Leu | Glu | Ile | Lys | | | | | | | | |
| | | | 100 | | | | | 105 | | | | | | | | | |

<210> 424
 <211> 532
 <212> PRT
 <213> Avian pneumovirus

<220>
 <223> Avian pneumovirus fusion protein gene

<400> 424

| | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| Met | Ser | Trp | Lys | Val | Val | Leu | Leu | Leu | Val | Leu | Leu | Ala | Thr | Pro | Thr | | |
| 1 | | | 5 | | | | | | 10 | | | | | 15 | | | |
| Gly | Gly | Leu | Glu | Glu | Ser | Tyr | Leu | Glu | Glu | Ser | Cys | Ser | Thr | Val | Thr | | |
| | | | 20 | | | | | 25 | | | | | 30 | | | | |
| Arg | Gly | Tyr | Leu | Ser | Val | Leu | Arg | Thr | Gly | Trp | Tyr | Thr | Asn | Val | Phe | | |
| | | | 35 | | | | 40 | | | | | 45 | | | | | |
| Thr | Leu | Gly | Val | Gly | Asp | Val | Lys | Asn | Leu | Thr | Cys | Thr | Asp | Gly | Pro | | |
| | 50 | | | | 55 | | | | | 60 | | | | | | | |
| Ser | Leu | Ile | Arg | Thr | Glu | Leu | Glu | Leu | Thr | Lys | Asn | Ala | Leu | Glu | Glu | | |
| 65 | | | | 70 | | | | | 75 | | | | | 80 | | | |
| Leu | Lys | Thr | Val | Ser | Ala | Asp | Gln | Leu | Ala | Lys | Glu | Ala | Arg | Ile | Met | | |
| | | | 85 | | | | 90 | | | | | | 95 | | | | |
| Ser | Pro | Arg | Lys | Ala | Arg | Phe | Val | Leu | Gly | Ala | Ile | Ala | Leu | Gly | Val | | |
| | | | 100 | | | | 105 | | | | | 110 | | | | | |
| Ala | Thr | Ala | Ala | Ala | Val | Thr | Ala | Gly | Val | Ala | Ile | Ala | Lys | Thr | Ile | | |
| | | | 115 | | | | 120 | | | | | 125 | | | | | |
| Arg | Leu | Glu | Gly | Glu | Val | Ala | Ala | Ile | Lys | Gly | Ala | Leu | Arg | Lys | Thr | | |
| | 130 | | | | | 135 | | | | 140 | | | | | | | |
| Asn | Glu | Ala | Val | Ser | Thr | Leu | Gly | Asn | Gly | Val | Arg | Val | Leu | Ala | Thr | | |
| 145 | | | | 150 | | | | | 155 | | | | | 160 | | | |
| Ala | Val | Asn | Asp | Leu | Lys | Asp | Phe | Ile | Ser | Lys | Lys | Leu | Thr | Pro | Ala | | |
| | | | 165 | | | | 170 | | | | | 175 | | | | | |
| Ile | Asn | Arg | Asn | Lys | Cys | Asp | Ile | Ser | Asp | Leu | Lys | Met | Ala | Val | Ser | | |

| | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| | | | 180 | | | | | 185 | | | | | 190 | | | | |
| Phe | Gly | Gln | Tyr | Asn | Arg | Arg | Phe | Leu | Asn | Val | Val | Arg | Gln | Phe | Ser | | |
| | | 195 | | | | | 200 | | | | | 205 | | | | | |
| Asp | Asn | Ala | Gly | Ile | Thr | Pro | Ala | Ile | Ser | Leu | Asp | Leu | Met | Thr | Asp | | |
| | 210 | | | | | 215 | | | | | 220 | | | | | | |
| Ala | Glu | Leu | Val | Arg | Ala | Val | Ser | Asn | Met | Pro | Thr | Ser | Ser | Gly | Gln | | |
| 225 | | | | 230 | | | | | | 235 | | | | | 240 | | |
| Ile | Asn | Leu | Met | Leu | Glu | Asn | Arg | Ala | Met | Val | Arg | Arg | Lys | Gly | Phe | | |
| | | | 245 | | | | | | 250 | | | | | 255 | | | |
| Gly | Ile | Leu | Ile | Gly | Val | Tyr | Gly | Ser | Ser | Val | Val | Tyr | Ile | Val | Gln | | |
| | | 260 | | | | | 265 | | | | | | 270 | | | | |
| Leu | Pro | Ile | Phe | Gly | Val | Ile | Asp | Thr | Pro | Cys | Trp | Arg | Val | Lys | Ala | | |
| | 275 | | | | | | 280 | | | | | 285 | | | | | |
| Ala | Pro | Leu | Cys | Ser | Gly | Lys | Asp | Gly | Asn | Tyr | Ala | Cys | Leu | Leu | Arg | | |
| | 290 | | | | | 295 | | | | | 300 | | | | | | |
| Glu | Asp | Gln | Gly | Trp | Tyr | Cys | Gln | Asn | Ala | Gly | Ser | Thr | Val | Tyr | Tyr | | |
| 305 | | | | 310 | | | | | | 315 | | | | | 320 | | |
| Pro | Asn | Glu | Glu | Asp | Cys | Glu | Val | Arg | Ser | Asp | His | Val | Phe | Cys | Asp | | |
| | | | 325 | | | | | | 330 | | | | | 335 | | | |
| Thr | Ala | Ala | Gly | Ile | Asn | Val | Ala | Lys | Glu | Ser | Glu | Glu | Cys | Asn | Arg | | |
| | | 340 | | | | | | 345 | | | | | 350 | | | | |
| Asn | Ile | Ser | Thr | Thr | Lys | Tyr | Pro | Cys | Lys | Val | Ser | Thr | Gly | Arg | His | | |
| | 355 | | | | | | 360 | | | | | 365 | | | | | |
| Pro | Ile | Ser | Met | Val | Ala | Leu | Ser | Pro | Leu | Gly | Ala | Leu | Val | Ala | Cys | | |
| | 370 | | | | | 375 | | | | | 380 | | | | | | |
| Tyr | Asp | Gly | Met | Ser | Cys | Ser | Ile | Gly | Ser | Asn | Lys | Val | Gly | Ile | Ile | | |
| 385 | | | | 390 | | | | | | 395 | | | | | 400 | | |
| Arg | Pro | Leu | Gly | Lys | Gly | Cys | Ser | Tyr | Ile | Ser | Asn | Gln | Asp | Ala | Asp | | |
| | | | 405 | | | | | | 410 | | | | | 415 | | | |
| Thr | Val | Thr | Ile | Asp | Asn | Thr | Val | Tyr | Gln | Leu | Ser | Lys | Val | Glu | Gly | | |
| | | 420 | | | | | | 425 | | | | | 430 | | | | |
| Glu | Gln | His | Thr | Ile | Lys | Gly | Lys | Pro | Val | Ser | Ser | Asn | Phe | Asp | Pro | | |
| | 435 | | | | | 440 | | | | | | 445 | | | | | |
| Ile | Glu | Phe | Pro | Glu | Asp | Gln | Phe | Asn | Val | Ala | Leu | Asp | Gln | Val | Phe | | |
| | 450 | | | | | 455 | | | | | 460 | | | | | | |
| Glu | Ser | Val | Glu | Lys | Ser | Gln | Asn | Leu | Ile | Asp | Gln | Ser | Asn | Lys | Ile | | |
| 465 | | | | 470 | | | | | | 475 | | | | | 480 | | |
| Leu | Asp | Ser | Ile | Glu | Lys | Gly | Asn | Ala | Gly | Phe | Val | Ile | Val | Ile | Val | | |
| | | | 485 | | | | | | 490 | | | | | 495 | | | |
| Leu | Ile | Val | Leu | Leu | Met | Leu | Ala | Ala | Val | Gly | Val | Gly | Val | Phe | Phe | | |
| | | 500 | | | | | | 505 | | | | | 510 | | | | |
| Val | Val | Lys | Lys | Arg | Lys | Ala | Ala | Pro | Lys | Phe | Pro | Met | Glu | Met | Asn | | |
| | | 515 | | | | | 520 | | | | | 525 | | | | | |
| Gly | Val | Asn | Asn | | | | | | | | | | | | | | |
| | 530 | | | | | | | | | | | | | | | | |

<210> 425

<211> 537

<212> PRT

<213> Avian pneumovirus

<220>

<223> Avian pneumovirus isolate 1b fusion protein mRNA

<400> 425

| | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| Met | Ser | Trp | Lys | Val | Val | Leu | Leu | Leu | Val | Leu | Leu | Ala | Thr | Pro | Thr | | |
| 1 | | | | 5 | | | | | 10 | | | | 15 | | | | |
| Gly | Gly | Leu | Glu | Glu | Ser | Tyr | Leu | Glu | Glu | Ser | Cys | Ser | Thr | Val | Thr | | |
| | | 20 | | | | | 25 | | | | 30 | | | | | | |
| Arg | Gly | Tyr | Leu | Ser | Val | Leu | Arg | Thr | Gly | Trp | Tyr | Thr | Asn | Val | Phe | | |

NY2: 1449616.1

Gly Val Asn Asn Lys Gly Phe Ile Pro
 530 535

<210> 426

<211> 538

<212> PRT

<213> Turkey rhinotracheitis virus

<220>

<223> Turkey rhinotracheitis virus gene for fusion
 protein (F1 and F2 subunits), complete cds

<400> 426

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Asp | Val | Arg | Ile | Cys | Leu | Leu | Leu | Phe | Leu | Ile | Ser | Asn | Pro | Ser |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Ser | Cys | Ile | Gln | Glu | Thr | Tyr | Asn | Glu | Glu | Ser | Cys | Ser | Thr | Val | Thr |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Arg | Gly | Tyr | Lys | Ser | Val | Leu | Arg | Thr | Gly | Trp | Tyr | Thr | Asn | Val | Phe |
| | | | 35 | | | | 40 | | | | | 45 | | | |
| Asn | Leu | Glu | Ile | Gly | Asn | Val | Glu | Asn | Ile | Thr | Cys | Asn | Asp | Gly | Pro |
| | 50 | | | | 55 | | | | | | 60 | | | | |
| Ser | Leu | Ile | Asp | Thr | Glu | Leu | Val | Leu | Thr | Lys | Asn | Ala | Leu | Arg | Glu |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Leu | Lys | Thr | Val | Ser | Ala | Asp | Gln | Val | Ala | Lys | Glu | Ser | Arg | Leu | Ser |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Ser | Pro | Arg | Arg | Arg | Arg | Phe | Val | Leu | Gly | Ala | Ile | Ala | Leu | Gly | Val |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Ala | Thr | Ala | Ala | Ala | Val | Thr | Ala | Gly | Val | Ala | Leu | Ala | Lys | Thr | Ile |
| | | | 115 | | | | 120 | | | | | 125 | | | |
| Arg | Leu | Glu | Gly | Glu | Val | Lys | Ala | Ile | Lys | Asn | Ala | Leu | Arg | Asn | Thr |
| | 130 | | | | 135 | | | | | | 140 | | | | |
| Asn | Glu | Ala | Val | Ser | Thr | Leu | Gly | Asn | Gly | Val | Arg | Val | Leu | Ala | Thr |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Ala | Val | Asn | Asp | Leu | Lys | Glu | Phe | Ile | Ser | Lys | Lys | Leu | Thr | Pro | Ala |
| | | | | 165 | | | | | 170 | | | | | 175 | |
| Ile | Asn | Gln | Asn | Lys | Cys | Asn | Ile | Ala | Asp | Ile | Lys | Met | Ala | Ile | Ser |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Phe | Gly | Gln | Asn | Asn | Arg | Arg | Phe | Leu | Asn | Val | Val | Arg | Gln | Phe | Ser |
| | 195 | | | | | 200 | | | | | | 205 | | | |
| Asp | Ser | Ala | Gly | Ile | Thr | Ser | Ala | Val | Ser | Leu | Asp | Leu | Met | Thr | Asp |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Asp | Glu | Leu | Val | Arg | Ala | Ile | Asn | Arg | Met | Pro | Thr | Ser | Ser | Gly | Gln |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 |
| Ile | Ser | Leu | Met | Leu | Asn | Asn | Arg | Ala | Met | Val | Arg | Arg | Lys | Gly | Phe |
| | | | | 245 | | | | | 250 | | | | | 255 | |
| Gly | Ile | Leu | Ile | Gly | Val | Tyr | Asp | Gly | Thr | Val | Val | Tyr | Met | Val | Gln |
| | | | 260 | | | | | 265 | | | | | 270 | | |
| Leu | Pro | Ile | Phe | Gly | Val | Ile | Glu | Thr | Pro | Cys | Trp | Arg | Val | Val | Ala |
| | | 275 | | | | | 280 | | | | | 285 | | | |
| Ala | Pro | Leu | Cys | Arg | Lys | Glu | Lys | Gly | Asn | Tyr | Ala | Cys | Ile | Leu | Arg |
| | 290 | | | | | 295 | | | | | 300 | | | | |
| Glu | Asp | Gln | Gly | Trp | Tyr | Cys | Thr | Asn | Ala | Gly | Ser | Thr | Ala | Tyr | Tyr |
| 305 | | | | | 310 | | | | | 315 | | | | | 320 |
| Pro | Asn | Lys | Asp | Asp | Cys | Glu | Val | Arg | Asp | Asp | Tyr | Val | Phe | Cys | Asp |
| | | | | 325 | | | | | 330 | | | | | 335 | |
| Thr | Ala | Ala | Gly | Ile | Asn | Val | Ala | Leu | Glu | Val | Glu | Gln | Cys | Asn | Tyr |
| | | | 340 | | | | | 345 | | | | | 350 | | |
| Asn | Ile | Ser | Thr | Ser | Lys | Tyr | Pro | Cys | Lys | Val | Ser | Thr | Gly | Arg | His |
| | | 355 | | | | 360 | | | | | | 365 | | | |
| Pro | Val | Ser | Met | Val | Ala | Leu | Thr | Pro | Leu | Gly | Gly | Leu | Val | Ser | Cys |
| | 370 | | | | | 375 | | | | | 380 | | | | |

```

Tyr Glu Ser Val Ser Cys Ser Ile Gly Ser Asn Lys Val Gly Ile Ile
385                               390                               400
Lys Gln Leu Gly Lys Gly Cys Thr His Ile Pro Asn Asn Glu Ala Asp
                               405                               410                               415
Thr Ile Thr Ile Asp Asn Thr Val Tyr Gln Leu Ser Lys Val Val Gly
                               420                               425                               430
Glu Gln Arg Thr Ile Lys Gly Ala Pro Val Val Asn Asn Phe Asn Pro
                               435                               440                               445
Ile Leu Phe Pro Glu Asp Gln Phe Asn Val Ala Leu Asp Gln Val Phe
450                               455                               460
Glu Ser Ile Asp Arg Ser Gln Asp Leu Ile Asp Lys Ser Asn Asp Leu
465                               470                               475                               480
Leu Gly Ala Asp Ala Lys Ser Lys Ala Gly Ile Ala Ile Ala Ile Val
                               485                               490                               495
Val Leu Val Ile Leu Gly Ile Phe Phe Leu Leu Ala Val Ile Tyr Tyr
                               500                               505                               510
Cys Ser Arg Val Arg Lys Thr Lys Pro Lys His Asp Tyr Pro Ala Thr
                               515                               520                               525
Thr Gly His Ser Ser Met Ala Tyr Val Ser
530                               535

```

```

<210> 427
<211> 537
<212> PRT
<213> Avian penumovirus

```

```

<220>
<223> Avian pneumovirus fusion glycoprotein (F) gene,
       complete cds

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<400> 427
Met Ser Trp Lys Val Val Leu Leu Leu Val Leu Leu Ala Thr Pro Thr
 1                               5                               10                               15
Gly Gly Leu Glu Glu Ser Tyr Leu Glu Glu Ser Cys Ser Thr Val Thr
 20                               25                               30
Arg Gly Tyr Leu Ser Val Leu Arg Thr Gly Trp Tyr Thr Asn Val Phe
 35                               40                               45
Thr Leu Glu Val Gly Asp Val Glu Asn Leu Thr Cys Thr Asp Gly Pro
 50                               55                               60
Ser Leu Ile Arg Thr Glu Leu Glu Leu Thr Lys Asn Ala Leu Glu Glu
 65                               70                               75                               80
Leu Lys Thr Val Ser Ala Asp Gln Leu Ala Lys Glu Ala Arg Ile Met
 85                               90                               95
Ser Pro Arg Lys Ala Arg Phe Val Leu Gly Ala Ile Ala Leu Gly Val
100                               105                               110
Ala Thr Ala Ala Ala Val Thr Ala Gly Val Ala Ile Ala Lys Thr Ile
115                               120                               125
Arg Leu Glu Gly Glu Val Ala Ala Ile Lys Gly Ala Leu Arg Lys Thr
130                               135                               140
Asn Glu Ala Val Ser Thr Leu Gly Asn Gly Val Arg Val Leu Ala Thr
145                               150                               155                               160
Ala Val Asn Asp Leu Lys Asp Phe Ile Ser Lys Lys Leu Thr Pro Ala
165                               170                               175
Ile Asn Arg Asn Lys Cys Asp Ile Ser Asp Leu Lys Met Ala Val Ser
180                               185                               190
Phe Gly Gln Tyr Asn Arg Arg Phe Leu Asn Val Val Arg Gln Phe Ser
195                               200                               205
Asp Asn Ala Gly Ile Thr Pro Ala Ile Ser Leu Asp Leu Met Thr Asp
210                               215                               220
Ala Glu Leu Val Arg Ala Val Ser Asn Met Pro Thr Ser Ser Gly Gln

```


225 230 235 240
 Ile Asn Leu Met Leu Glu Asn Arg Ala Met Val Arg Arg Lys Gly Phe
 245 250 255
 Gly Ile Leu Ile Gly Val Tyr Gly Ser Ser Val Val Tyr Ile Val Gln
 260 265 270
 Leu Pro Ile Phe Gly Val Ile Asp Thr Pro Cys Trp Lys Val Lys Ala
 275 280 285
 Ala Pro Leu Cys Ser Gly Lys Asp Gly Asn Tyr Ala Cys Leu Leu Arg
 290 295 300
 Glu Asp Gln Gly Trp Tyr Cys Gln Asn Ala Gly Ser Thr Val Tyr Tyr
 305 310 315 320
 Pro Asn Glu Glu Asp Cys Glu Val Arg Ser Asp His Val Phe Cys Asp
 325 330 335
 Thr Ala Ala Gly Ile Asn Val Ala Lys Glu Ser Glu Glu Cys Asn Arg
 340 345 350
 Asn Ile Ser Thr Thr Lys Tyr Pro Cys Lys Val Ser Thr Gly Arg His
 355 360 365
 Pro Ile Ser Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys
 370 375 380
 Tyr Asp Gly Met Ser Cys Ser Ile Gly Ser Asn Lys Val Gly Ile Ile
 385 390 395 400
 Arg Pro Leu Gly Lys Gly Cys Ser Tyr Ile Ser Asn Gln Asp Ala Asp
 405 410 415
 Thr Val Thr Ile Asp Asn Thr Val Tyr Gln Leu Ser Lys Val Glu Gly
 420 425 430
 Glu Gln His Thr Ile Lys Gly Lys Pro Val Ser Ser Asn Phe Asp Pro
 435 440 445
 Ile Glu Phe Pro Glu Asp Gln Phe Asn Ile Ala Leu Asp Gln Val Phe
 450 455 460
 Glu Ser Val Glu Lys Ser Gln Asn Leu Ile Asp Gln Ser Asn Lys Ile
 465 470 475 480
 Leu Asp Ser Ile Glu Lys Gly Asn Ala Gly Phe Val Ile Val Ile Val
 485 490 495
 Leu Ile Val Leu Leu Met Leu Ala Ala Val Gly Val Gly Val Phe Phe
 500 505 510
 Val Val Lys Lys Arg Lys Ala Ala Pro Lys Phe Pro Met Glu Met Asn
 515 520 525
 Gly Val Asn Asn Lys Gly Phe Ile Pro
 530 535

<210> 428

<211> 391

<212> PRT

<213> Turkey rhinotracheitis virus

<220>

<223> Turkey rhinotracheitis virus (strain CVL14/1)
 attachment protien (G) mRNA, complete cds

<400> 428

Met Gly Ser Lys Leu Tyr Met Ala Gln Gly Thr Ser Ala Tyr Gln Thr
 1 5 10 15
 Ala Val Gly Phe Trp Leu Asp Ile Gly Arg Arg Tyr Ile Leu Ala Ile
 20 25 30
 Val Leu Ser Ala Phe Gly Leu Thr Cys Thr Val Thr Ile Ala Leu Thr
 35 40 45
 Val Ser Val Ile Val Glu Gln Ser Val Leu Glu Glu Cys Arg Asn Tyr
 50 55 60
 Asn Gly Gly Asp Arg Asp Trp Trp Ser Thr Thr Gln Glu Gln Pro Thr
 65 70 75 80

| | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| Thr | Ala | Pro | Ser | Ala | Thr | Pro | Ala | Gly | Asn | Tyr | Gly | Gly | Leu | Gln | Thr | | |
| | | | | 85 | | | | | 90 | | | | | 95 | | | |
| Ala | Arg | Thr | Arg | Lys | Ser | Glu | Ser | Cys | Leu | His | Val | Gln | Ile | Ser | Tyr | | |
| | | | 100 | | | | | 105 | | | | | 110 | | | | |
| Gly | Asp | Met | Tyr | Ser | Arg | Ser | Asp | Thr | Val | Leu | Gly | Gly | Phe | Asp | Cys | | |
| | | 115 | | | | | 120 | | | | | 125 | | | | | |
| Met | Gly | Leu | Leu | Val | Leu | Cys | Lys | Ser | Gly | Pro | Ile | Cys | Gln | Arg | Asp | | |
| | | 130 | | | | 135 | | | | | 140 | | | | | | |
| Asn | Gln | Val | Asp | Pro | Thr | Ala | Leu | Cys | His | Cys | Arg | Val | Asp | Leu | Ser | | |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 | | |
| Ser | Val | Asp | Cys | Cys | Lys | Val | Asn | Lys | Ile | Ser | Thr | Asn | Ser | Ser | Thr | | |
| | | | 165 | | | | | | 170 | | | | | 175 | | | |
| Thr | Ser | Glu | Pro | Gln | Lys | Thr | Asn | Pro | Ala | Trp | Pro | Ser | Gln | Asp | Asn | | |
| | | | 180 | | | | | 185 | | | | | 190 | | | | |
| Thr | Asp | Ser | Asp | Pro | Asn | Pro | Gln | Gly | Ile | Thr | Thr | Ser | Thr | Ala | Thr | | |
| | | 195 | | | | | 200 | | | | | 205 | | | | | |
| Leu | Leu | Ser | Thr | Ser | Leu | Gly | Leu | Met | Leu | Thr | Ser | Lys | Thr | Gly | Thr | | |
| | | 210 | | | | 215 | | | | | 220 | | | | | | |
| His | Lys | Ser | Gly | Pro | Pro | Gln | Ala | Leu | Pro | Gly | Ser | Asn | Thr | Asn | Gly | | |
| 225 | | | | 230 | | | | | | 235 | | | | | 240 | | |
| Lys | Thr | Thr | Thr | Asp | Arg | Glu | Pro | Gly | Pro | Thr | Asn | Gln | Pro | Asn | Ser | | |
| | | | | 245 | | | | | 250 | | | | | 255 | | | |
| Thr | Thr | Asn | Gly | Gln | His | Asn | Lys | His | Thr | Gln | Arg | Met | Thr | Pro | Pro | | |
| | | 260 | | | | | | 265 | | | | | 270 | | | | |
| Pro | Ser | His | Asp | Asn | Thr | Arg | Thr | Ile | Leu | Gln | His | Thr | Thr | Pro | Trp | | |
| | | 275 | | | | | 280 | | | | | 285 | | | | | |
| Glu | Lys | Thr | Phe | Ser | Thr | Tyr | Lys | Pro | Thr | His | Ser | Pro | Thr | Asn | Glu | | |
| | | 290 | | | | 295 | | | | | 300 | | | | | | |
| Ser | Asp | Gln | Ser | Leu | Pro | Thr | Thr | Gln | Asn | Ser | Ile | Asn | Cys | Glu | His | | |
| 305 | | | | 310 | | | | | | 315 | | | | 320 | | | |
| Phe | Asp | Pro | Gln | Gly | Lys | Glu | Lys | Ile | Cys | Tyr | Arg | Val | Gly | Ser | Tyr | | |
| | | | 325 | | | | | | 330 | | | | | 335 | | | |
| Asn | Ser | Asn | Ile | Thr | Lys | Gln | Cys | Arg | Ile | Asp | Val | Pro | Leu | Cys | Ser | | |
| | | 340 | | | | | | 345 | | | | | 350 | | | | |
| Thr | Tyr | Ser | Thr | Val | Cys | Met | Lys | Thr | Tyr | Tyr | Thr | Glu | Pro | Phe | Asn | | |
| | | 355 | | | | | 360 | | | | | 365 | | | | | |
| Cys | Trp | Arg | Arg | Ile | Trp | Arg | Cys | Leu | Cys | Asp | Asp | Gly | Val | Gly | Leu | | |
| | 370 | | | | | 375 | | | | | 380 | | | | | | |
| Val | Glu | Trp | Cys | Cys | Thr | Ser | | | | | | | | | | | |
| 385 | | | | | 390 | | | | | | | | | | | | |

<210> 429

<211> 414

<212> PRT

<213> rhinotracheitis virus

<220>

<223> Turkey rhinotracheitis virus (strain 6574)
attachment protein (G)

<400> 429

| | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| Met | Gly | Ser | Glu | Leu | Tyr | Ile | Ile | Glu | Gly | Val | Ser | Ser | Ser | Glu | Ile | | |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | | | |
| Val | Leu | Lys | Gln | Val | Leu | Arg | Arg | Ser | Gln | Lys | Ile | Leu | Leu | Gly | Leu | | |
| | | 20 | | | | | | 25 | | | | | 30 | | | | |
| Val | Leu | Ser | Ala | Leu | Gly | Leu | Thr | Leu | Thr | Ser | Thr | Ile | Val | Ile | Ser | | |
| | | 35 | | | | 40 | | | | | | 45 | | | | | |
| Ile | Cys | Ile | Ser | Val | Glu | Gln | Val | Lys | Leu | Arg | Gln | Cys | Val | Asp | Thr | | |
| | 50 | | | | | 55 | | | | 60 | | | | | | | |
| Tyr | Trp | Ala | Glu | Asn | Gly | Ser | Leu | His | Pro | Gly | Gln | Ser | Thr | Glu | Asn | | |
| 65 | | | | | 70 | | | | | 75 | | | | 80 | | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Thr | Ser | Thr | Arg | Gly | Lys | Thr | Thr | Thr | Lys | Asp | Pro | Arg | Arg | Leu | Gln |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Ala | Thr | Gly | Ala | Gly | Lys | Phe | Glu | Ser | Cys | Gly | Tyr | Val | Gln | Val | Val |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Asp | Gly | Asp | Met | His | Asp | Arg | Ser | Tyr | Ala | Val | Leu | Gly | Gly | Val | Asp |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Cys | Leu | Gly | Leu | Leu | Ala | Leu | Cys | Glu | Ser | Gly | Pro | Ile | Cys | Gln | Gly |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Asp | Thr | Trp | Ser | Glu | Asp | Gly | Asn | Phe | Cys | Arg | Cys | Thr | Phe | Ser | Ser |
| 145 | | | | 150 | | | | | 155 | | | | | 160 | |
| His | Gly | Val | Ser | Cys | Cys | Lys | Lys | Pro | Lys | Ser | Lys | Ala | Thr | Thr | Ala |
| | | | | 165 | | | | 170 | | | | | | 175 | |
| Gln | Arg | Asn | Ser | Lys | Pro | Ala | Asn | Ser | Lys | Ser | Thr | Pro | Pro | Val | His |
| | | 180 | | | | | 185 | | | | | 190 | | | |
| Ser | Asp | Arg | Ala | Ser | Lys | Glu | His | Asn | Pro | Ser | Gln | Gly | Glu | Gln | Pro |
| | 195 | | | | | 200 | | | | | 205 | | | | |
| Arg | Arg | Gly | Pro | Thr | Ser | Ser | Lys | Thr | Thr | Ile | Ala | Ser | Thr | Pro | Ser |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Thr | Glu | Asp | Thr | Ala | Lys | Pro | Thr | Ile | Ser | Lys | Pro | Lys | Leu | Thr | Ile |
| 225 | | | | | 230 | | | | | 235 | | | | 240 | |
| Arg | Pro | Ser | Gln | Arg | Gly | Pro | Ser | Gly | Ser | Thr | Lys | Ala | Ala | Ser | Ser |
| | | | 245 | | | | | 250 | | | | | | 255 | |
| Thr | Pro | Ser | His | Lys | Thr | Asn | Thr | Arg | Gly | Thr | Ser | Lys | Thr | Thr | Asp |
| | | 260 | | | | | 265 | | | | | | 270 | | |
| Gln | Arg | Pro | Arg | Thr | Gly | Pro | Thr | Pro | Glu | Arg | Pro | Arg | Gln | Thr | His |
| | 275 | | | | | 280 | | | | | | 285 | | | |
| Ser | Thr | Ala | Thr | Pro | Pro | Pro | Thr | Thr | Pro | Ile | His | Lys | Gly | Arg | Ala |
| | 290 | | | | | 295 | | | | | 300 | | | | |
| Pro | Thr | Pro | Lys | Pro | Thr | Thr | Asp | Leu | Lys | Val | Asn | Pro | Arg | Glu | Gly |
| 305 | | | | 310 | | | | | | 315 | | | | 320 | |
| Ser | Thr | Ser | Pro | Thr | Ala | Ile | Gln | Lys | Asn | Pro | Thr | Thr | Gln | Ser | Asn |
| | | | 325 | | | | | 330 | | | | | | 335 | |
| Leu | Val | Asp | Cys | Thr | Leu | Ser | Asp | Pro | Asp | Glu | Pro | Gln | Arg | Ile | Cys |
| | | 340 | | | | | 345 | | | | | 350 | | | |
| Tyr | Gln | Val | Gly | Thr | Tyr | Asn | Pro | Ser | Gln | Ser | Gly | Thr | Cys | Asn | Ile |
| | 355 | | | | | 360 | | | | | | 365 | | | |
| Glu | Val | Pro | Lys | Cys | Ser | Thr | Tyr | Gly | His | Ala | Cys | Met | Ala | Thr | Leu |
| | 370 | | | | | 375 | | | | | 380 | | | | |
| Tyr | Asp | Thr | Pro | Phe | Asn | Cys | Trp | Arg | Arg | Thr | Arg | Arg | Cys | Ile | Cys |
| 385 | | | | 390 | | | | | | 395 | | | | 400 | |
| Asp | Ser | Gly | Gly | Glu | Leu | Ile | Glu | Trp | Cys | Cys | Thr | Ser | Gln | | |
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<210> 430

<211> 46

<212> PRT

<213> human metapneumovirus

<220>

<223> Postulated HRA sequence of strain NL1/00

<400> 430

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Lys | Thr | Ile | Arg | Leu | Glu | Ser | Glu | Val | Thr | Ala | Ile | Lys | Asn | Ala | Leu |
| 1 | | | | 5 | | | | 10 | | | | | 15 | | |
| Lys | Lys | Thr | Asn | Glu | Ala | Val | Ser | Thr | Leu | Gly | Asn | Gly | Val | Arg | Val |
| | | | 20 | | | | 25 | | | | | 30 | | | |
| Leu | Ala | Thr | Ala | Val | Arg | Glu | Leu | Lys | Asp | Phe | Val | Ser | Lys | | |
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<210> 431

<211> 46

<212> PRT

<213> human metapneumovirus

<220>

<223> Postulated HRA sequence of strain NL17/00

<400> 431

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Lys | Thr | Ile | Arg | Leu | Glu | Ser | Glu | Val | Thr | Ala | Ile | Lys | Asn | Ala | Leu |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Lys | Thr | Thr | Asn | Glu | Ala | Val | Ser | Thr | Leu | Gly | Asn | Gly | Val | Arg | Val |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Leu | Ala | Thr | Ala | Val | Arg | Glu | Leu | Lys | Asp | Phe | Val | Ser | Lys | | |
| | | | 35 | | | | 40 | | | | | 45 | | | |

<210> 432

<211> 46

<212> PRT

<213> human metapneumovirus

<220>

<223> Postulated HRA sequence of strain NL1/99

<400> 432

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Lys | Thr | Ile | Arg | Leu | Glu | Ser | Glu | Val | Asn | Ala | Ile | Lys | Gly | Ala | Leu |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Lys | Gln | Thr | Asn | Glu | Ala | Val | Ser | Thr | Leu | Gly | Asn | Gly | Val | Arg | Val |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Leu | Ala | Thr | Ala | Val | Arg | Glu | Leu | Lys | Glu | Phe | Val | Ser | Lys | | |
| | | | 35 | | | | 40 | | | | | 45 | | | |

<210> 433

<211> 46

<212> PRT

<213> human metapneumovirus

<220>

<223> Postulated HRA sequence of strain NL1/94

<400> 433

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Lys | Thr | Ile | Arg | Leu | Glu | Ser | Glu | Val | Asn | Ala | Ile | Lys | Gly | Ala | Leu |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Lys | Thr | Thr | Asn | Glu | Ala | Val | Ser | Thr | Leu | Gly | Asn | Gly | Val | Arg | Val |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Leu | Ala | Thr | Ala | Val | Arg | Glu | Leu | Lys | Glu | Phe | Val | Ser | Lys | | |
| | | | 35 | | | | 40 | | | | | 45 | | | |

<210> 434

<211> 29

<212> PRT

<213> human metapneumovirus

<220>

<223> Postulated HRB sequence of strain NL1/00

<400> 434

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asn | Val | Ala | Leu | Asp | Gln | Val | Phe | Glu | Ser | Ile | Glu | Asn | Ser | Gln | Ala |
| 1 | | | | 5 | | | | 10 | | | | | | 15 | |
| Leu | Val | Asp | Gln | Ser | Asn | Arg | Ile | Leu | Ser | Ser | Ala | Glu | | | |
| | | | 20 | | | | 25 | | | | | | | | |

<210> 435

<211> 29

<212> PRT
 <213> human metapneumovirus

 <220>
 <223> Postulated HRB sequence of strain NL17/00

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 1 5 10 15
 Leu Val Asp Gln Ser Asn Arg Ile Leu Ser Ser Ala Glu
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 <211> 29
 <212> PRT
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 <220>
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 <400> 436
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 1 5 10 15
 Leu Val Asp Gln Ser Asn Lys Ile Leu Asn Ser Ala Glu
 20 25

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 <212> PRT
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 <220>
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 <400> 437
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 1 5 10 15
 Leu Val Asp Gln Ser Asn Lys Ile Leu Asn Ser Ala Glu
 20 25